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A MONTHLY JOURNAL DEVOTED TO THE DISEASES OF INFANTS AND CHILDREN

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EDITORIAL

THE TUBERCULOUS FAMILY

One of the most urgent problems in the fight against tuberculosis is what to do with the tuberculous, which is not so trite a statement as appears at first glance. It is not a purely medical question nowadays, if, indeed, it ever was. It is really an economic problem, a matter of dollars and cents. Given care, fresh air, plentiful nourishing food, rest and freedom from worry, the usual case of tuberculosis becomes arrested or cured; that is, a not too advanced subject with sanatorium treatment and a placid mind will oftener than not do well.

But how is a large city, such as New York City for instance, to get the sanatorium facilities for its yearly over 20,000 new cases of tuberculosis? Had we at hand millions of dollars the fight against tuberculosis by the sanatorium method might be won reasonably soon. As things are, this method can play but a small part in the final victory which must come.

The von Pirquet reactions in our children's clinics, whether done on children of tuberculous parents or not, show that 75 per cent. to 83 per cent. of children have met the tubercle bacillus before they are fourteen years of age. Recruits for the vast army of death, maimed individuals to a greater or less degree, economic burdens to the commonwealth, many of them. Consider what it means to the State to have so large a proportion of its population growing up with the possibility of becoming dependent adults.

Consider, also, what it means to the children from the larger, humanitarian point of view, for they are more sinned against than sinning in the matter of infection. Seldom is the problem presented by a child in one of our tuberculous classes a problem of the individual, or even the problem of childhood alone. Usually there is at home another tuberculous person, an older brother or sister, a father or mother, a grandparent, or—a boarder. The infant with tuberculous meningitis has played on the floor by the grandmother with a winter cough, or been the companion of a father invalided home with "a bit o' cold on the chist and a wastin' o' the strenth." The school girl must stop school every now and then because she has a bronchitis which will not stay away, and because she gets pale and thin. For her at home, perhaps, there is a worn-out mother, racked by her own coughing and tired before she gets up, who, while she gives her little girl, almost with every breath, tubercle bacilli in abundance, yet cannot make home comfortable or cook suitable food. All the dread tale of crowded tenements, dark, airless rooms, cold, hunger and weariness has its place in the environment of each little patient for whom we try to do.

Yet such as it is, however humble, this is home to the child, and when we send the sick patient to the hospital we break the home up, and we take away what we cannot replace, and we impair to a great degree the economic efficiency of this social unit.

The Home Hospital experiment of the New York Association for Improving the Condition of the Poor has approached the problem of the tuberculous family from the correct angle, and the results of two years' operation of the Home Hospital seem to presage well for an economical and efficient method of attacking the problem of tuberculosis in general.

The questions it set out to answer were:

"(1) Is it possible to treat families in which one or more members are afflicted with tuberculosis by keeping the family together, in their own individual home, without danger to other members of the family?

"(2) Do the results of treating patients in their own homes under satisfactory conditions of living, with adequate medical supervision, compare favorably with results secured by removing the patient from his home and treating him in a sanatorium or other special institution for tuberculosis?

"(3) In the case of a family in which there is combined tuberculosis and poverty, which costs more: to treat the family as a unit, as is done in the Home Hospital experiment, or to break up the family, as is done under other methods of treating families with tuberculosis?"

The plan of operation has been to take a sanitary tenement built with the idea of having sunlight and fresh air in abundance, and placing therein families selected because one or several members were tuberculous, keeping the family together, making use of whatever earning capacity its members have, and supplementing this with all the family lacks to permit of proper rest, food, sunlight, fresh air for the ill ones, and a decent home for the well ones.

"The Home Hospital, ideally located at 78th Street and John Jay Park, occupies two entire sections of the East River Homes. . . . Two open staircases lead to the forty-eight apartments, consisting of from two to four rooms each, including one or more bed chambers with open-air sleeping balconies. From a sanitary standpoint these apartments far excel the most exclusive apartments in New York City. No expense has been spared to provide a maximum amount of sunlight and ventilation to each

(Continued on page 80)

EDITORIAL NOTE

The Archives is pleased to announce the accession to its editorial staff of Dr. Harold Ruckman Mixsell, A.B., M.D. Dr. Mixsell's editorial and pediatric experience peculiarly fit him for the task of associate editor, and we have no doubt that his work on the staff will be immediately appreciated by our readers. It will be the aim of the Archives during the coming year to present to its readers a wider survey of pediatric literature in its Department of Abstracts than ever before, and to that end we have enlisted the able associates whose names appear at the head of that department.

ORIGINAL COMMUNICATIONS

PRECOCIOUS MATURITY IN GIRLS, WITH REPORT OF A CASE

BY FENWICK BEEKMAN, M.D.

Instructor in Operative Surgery, Cornell University Medical College
New York City

Puberty is reached when the sexual organs of an individual are developed to that state in which reproduction is possible. This takes place normally at the end of childhood before the body has attained its full growth. In addition to this, certain secondary changes occur which we call the symptoms of puberty and which bring the body of the individual nearer that of the adult. Development of the genital organs takes place. In man hair appears on the face and body as well as thick masses on the pubes and in the axilla, the voice deepens from hypertrophy of the larynx, his mentality changes and he seeks the company of the opposite sex. In woman the breasts become prominent, the hips widen, a layer of subcutaneous fat is deposited, rounding off the limbs; there is a growth of hair on the pubes and in the axilla, and, as in man, there are mental changes.

Growth ceases a short time after the onset of puberty, Tandler (Wien. klin. Woch., 1910, Vol. XXIII., p. 459) stating that skeletal growth is importantly influenced by the age at which genital maturity takes place, epiphyseal ossification having a direct relationship to the age of puberty; thus in eunuchs epiphyseal ossification is delayed, with a consequent increase in height. We do not know the primary stimulus which controls these changes, but we do know that there are certain glands, the internal secretion of which are necessary for body growth and sexual maturity; of these may be named the genitive, adrenal, thymus, thyroid, pituitary and pineal glands. In relation to this I wish to report the following case of precocious maturity which I have been fortunate enough to see:—

M. H.,* a girl of six and one-half years of age, was seen for the first time on April 20, 1914, when she applied for treatment of an impetigo of the scalp and ringworm of the chest. It was

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*** Surgical Clinic of the Wilkes Dispensary, St. Mary's Free Hospital for Children.**

noticed at this time that the child was over-developed and, on inquiry, the following history was elicited: The family history

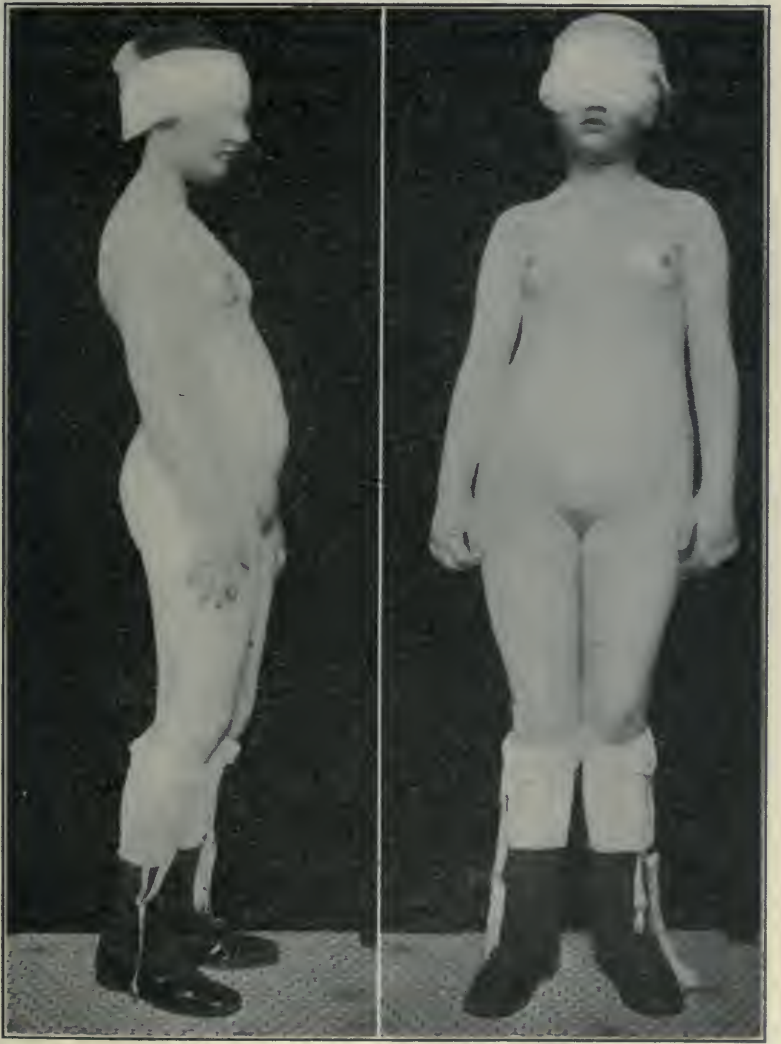

FIG. 1. M. H., six years old, with development of secondary sexual characteristics of a young woman of sixteen

was commonplace; the mother is of German parentage, the father was born in Ireland. One brother, fifteen years of age, and one sister, eighteen years old, living and well and show no abnormalities. Her mother has had three miscarriages since the child was born. At birth the child seemed normal; the mother thinks she weighed 7½ pounds; labor was not difficult. The first teeth are said to have erupted at seven months and she walked at nine months. She was a healthy child and nothing abnormal was noticed until she was about four years of age, when she commenced to have peculiar laughing spells, which at times lasted as long as an hour. She never became unconscious during these seizures. Soon after this it was noticed that her breasts were becoming prominent and she commenced to bleed from her vagina periodically. This has continued up to the present time. At times only a month elapses between these periods; at other times several months may intervene. Each period lasts about three days. The child goes to school and is considered by her teachers

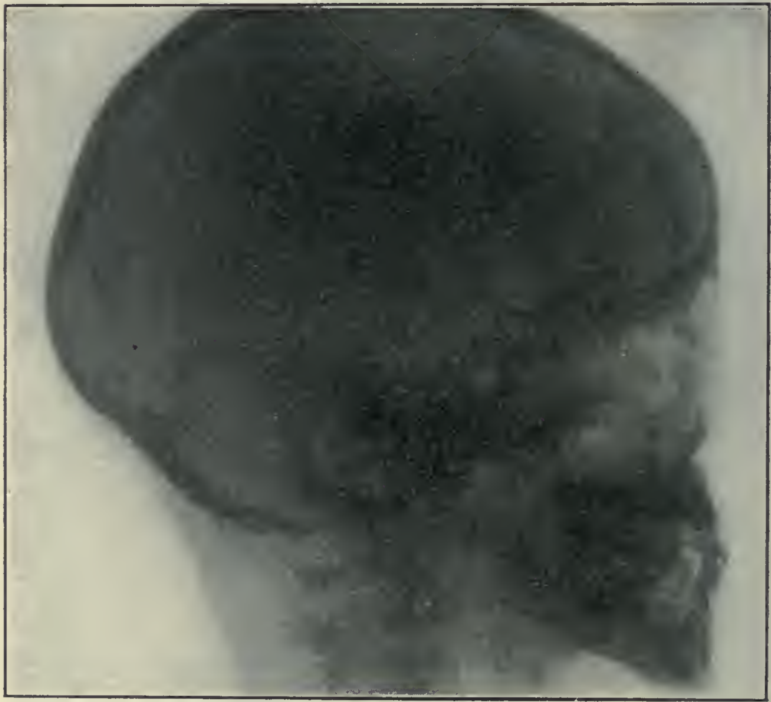

Fig. 2. Roentgenogram of skull. Note size of sella turcica and the development of sinuses

to be as bright as other girls of her age. She plays with girls older than herself, for the younger ones are frightened by the laughing spells which were previously mentioned. The patient is very fond of dolls, and her mother says her treatment of them is very maternal.

On examination we find a girl who appears to have the bodily development of a young woman of sixteen years of age. Her skin is smooth but dry, her hair is thick and luxuriant, her face has the expression and features of a grown girl and her neck is full and rounded. The hands are small with slender, tapering fingers. The thorax resembles that of a woman. The breasts are well developed, prominent and firm, with inverted nipples which are surrounded by a wide pigmented areola, and just under each breast is a rudimentary accessory nipple. The abdomen and thighs are covered with a thick layer of subcutaneous fat; the former is prominent. The hips are wide and the thighs are well developed and rounded. In the axilla is a fine down-like hair; there are no signs of hair upon the face or abdomen. The external genitalia are well developed, the mons veneris is prominent and covered by a fine growth of long black hair. The labia are large and the hymen, which is unruptured, allows the tip of the little finger to enter the vagina. During the examination she does not appear any more modest than an ordinary child of her age. The following measurements are made:—

Height	54¾	inches
Weight	71	pounds
Circumference of head	19¾	inches
" " neck	11	"
" " chest	26½	"
" " abdomen just below ensiform	24	"
" " abdomen at umbilicus	27¼	"
" " hips	30	"
" " thighs	11¾	"
" " knees	11¾	"
Distance between anterior superior spines	7½	"

The thyroid gland is not enlarged and could not be palpated. Heart and lungs are normal, abdomen is soft, liver and spleen are apparently normal, and neither kidney can be palpated. With a finger in the rectum and the other hand palpating the abdomen it is thought that the uterus can be demonstrated, larger than would be expected in a child of her age.

At times during the examination the child has seizures of foolish laughter which she appears unable to control. She is bashful, but will answer questions, is able to repeat the alphabet, spell simple words and does elementary sums in arithmetic.

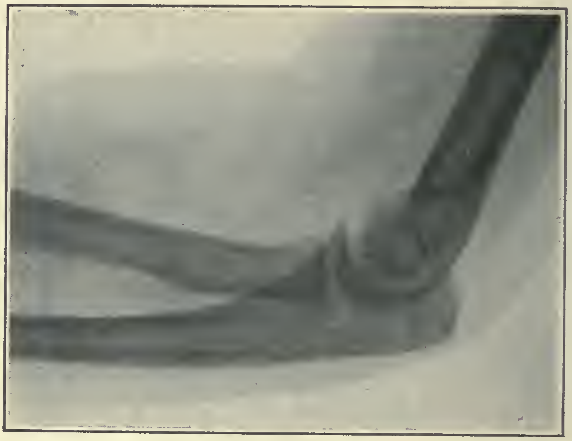

FIG. 3. Roentgenogram of elbow-joint. Notice union of epiphyses

Three weeks after her first examination she was brought to me during one of her periods. She had been menstruating for two days at the time and the discharge was typical menstrual blood in appearance and odor. During her other examinations she had been quite unselfconscious, but the fact of menstruating seemed to make her much ashamed.

The X-ray pictures confirm the diagnosis of her condition. The findings are better understood by studying the illustrations than by any description that might be given. However, it must be remembered that the development of the epiphyses cannot be classified in a chronological manner, for, since the advent of the X-ray, it has been shown that the development of bone in children of the same age may vary considerably and therefore only approximate estimation of the age can be made by study of the growth of the epiphyses.

The skull shows a development comparable to that of an individual of nine or ten years of age; the frontal sinus, ethmoid air cells, sphenoid air cells, antrums and mastoid cells are well developed and show well in the plates.

From a possible etiological standpoint the large sella turcica is of interest. The permanent teeth do not show a marked pre mature state of eruption, however; the first molars are fully grown, the second molars are almost ready to break through, while the bicuspids and canines are still deeply embedded in the jaw and the third lower molars are not as yet visible.

The elbow joint shows a rather marked development. Around this joint are six centers of ossification to be considered—the capitellum, trochlear surface, internal epicondyle, external epicondyle, head of the radius and olecranon process. At the age of seven the following centers of ossification should be present, the humerus, radius, ulna, capitellum, head of radius and internal epicondyle. The center of ossification of the olecranon should appear about the tenth year, that of the trochlear the twelfth year and the external epicondyle in the thirteenth or fourteenth year, and all these centers should be joined to their respective shafts about the eighteenth year. However, in the joint under consideration these centers are all ossified and their epiphyseal lines can barely be discerned, resembling a development of at least sixteen or seventeen years of age.

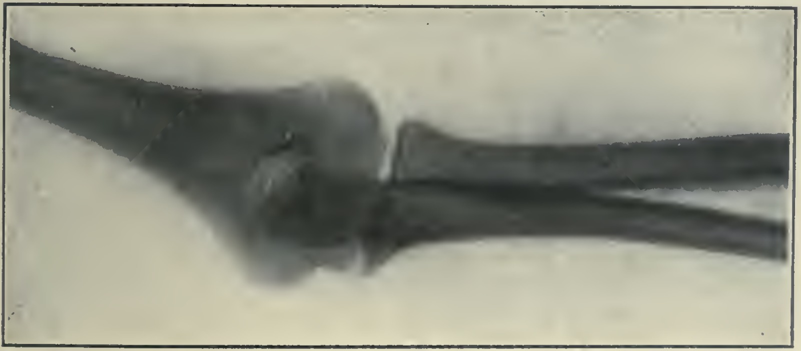

FIG. 3*a*. Roentgenogram of elbow-joint. Notice union of epiphyses

In the wrist and hand ossification is present to an advanced degree. The lower epiphyses of the radius and ulna are extensively developed and are separated from their shafts by only a narrow line of cartilage. The carpal bones, instead of being represented by widely separated oval shadows, are seen to have their anatomical form and are in close apposition with one another, even the shadow of the pisiform bone, which usually does not commence to show signs of ossification until the twelfth year, is seen here fully developed. The metacarpal and phalangeal epiphyses are separated from their shafts by only a narrow line; the distal phalanges are small.

The ankle and foot are in the same stage of advanced development as the wrist and hand; the tibial epiphysis is about to join the shaft and the tarsus throw shadows of fully developed bones and are in articulation with one another.

Precocious maturity or pubertas precox in the female child is not a very common condition, thus Lenz, in 1913 (Arch. f. Gynak., 1913, Vol. XCIX., p. 67), reports 130 cases which he had collected. Gegenbach (Journal of American Medical Association, 1914, Vol. LXI., p. 563) observed a case in January, 1913, and collected eight other reports which had not been found by Lenz. Morse (ARCHIVES OF PEDIATRICS, 1897, Vol. XIV., p. 241) reported a case in 1897 with references to 56 others from literature. I have separated from these bibliographies 150 reports which give sufficient data to be classed as cases of precocious maturity; these, together with the case I report, bring the total to 151.

Puberty among some races commences normally in the ninth or tenth year, hence we shall consider only those case reports which show symptoms of precocious maturity previous to the eighth year. These symptoms are simply an advanced development of the individual, both somatic and sexual. Morse (ARCHIVES OF PEDIATRICS, 1897, Vol. XIV., p. 241), in the study of 57 cases, came to the conclusion that some sign of the condition is present at the time of birth, shown either by increase of weight or height, presence of hair on pubes, prominence of breasts or, at times, menstrual flow. The time of onset, however, is variable. Lenz was able to obtain this information in 122 of his cases: 1 was menstruating at the time of birth, 3 menstruated in the first week after birth, while 43 showed signs within the first year, 23 in the second year, 17 in the third year, 16 in the fourth year, 6 in the fifth year, 6 in the sixth year, and 4 in the seventh year.

The first sign noticed is usually bleeding from the vagina, which returns periodically. Soon after, the breasts become prominent and the figure rounds out, resembling that of a mature woman. In fact, the entire somatic development is in advance of the normal, the weight and height are increased, there is a growth of axillary hair, the external genital organs become matured, the mons veneris becoming prominent and covered with hair and the labia majora filling out. The breasts are prominent and the areola surrounding the nipple is pigmented. The internal organs as well as the external appearance show signs of maturity.

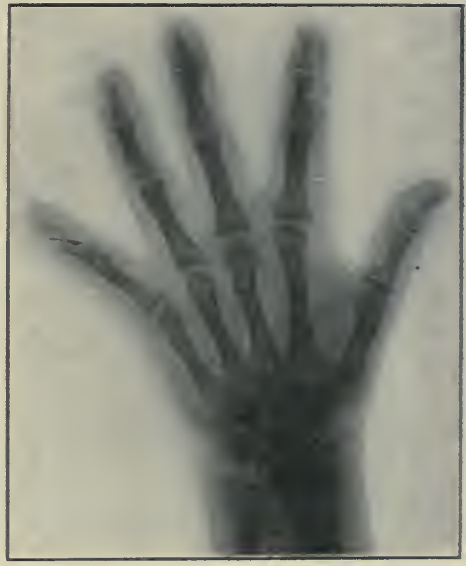

FIG. 4. Roentgenogram of hand showing the advanced development of the carpal bones

Prochowinck (Archiv. f. Gynak., 1881, Vol. XVII., p. 330) reports an autopsy upon a case of precocious maturity. His patient was three years old at the time of death. She had begun to menstruate when one year old; the periods were regular and lasted three days. Death occurred forty-eight hours after cessation of the menstrual bleeding, from acute bronchitis. The necropsy showed slightly developed breasts which, however, contained glandular tissue; the uterus was well developed and the endometrium showed marked postmenstrual changes; the ovaries showed signs of recent ovulation, a ruptured Graffian follicle being present. Besides these findings of precocious maturity, tuberculosis and rickets were demonstrated.

The X-ray, however, gives us the best evidence of the somatic conditions by showing the advanced stage of skeletal development. Lenz (Arch. f. Gynak., 1913, Vol. XCIX., p. 67), Neuroth (Wien. Med. Woch., 1909, Vol. LIX., p. 1,302), and

Wolf (Zentralbl. f. Gynak., 1911, p. 1,543) have reported cases with accompanying Röntgenograms which show changes similar to those of the case just reported. These changes, which correspond to those of the soft parts, are of skeletal maturity; the bones are larger, the Röntgenograms show the structure of the bone, and the edges, instead of being ill defined and rounded off, as seen in pictures of actively growing bones, are sharp and angular. The ossification is in advance of what would be expected in individuals of their age, the epiphyses having joined or being only separated from the shafts by thin lines of cartilage. Neuroth (Wien. Med. Woch., 1909, Vol. LIX., p. 1,302) and Lenz (Arch. f. Gynak., 1913, Vol. XCIX., p. 67) call our particular attention to the pelves of these individuals, which resemble those of a sexually matured woman.

The size of these children is far in advance of that of normal girls of corresponding age, and as the condition of the epiphyses of their bones is also advanced we might expect their growth to cease much sooner than it would normally; and this is what actually occurs, for by the tenth or twelfth year, when complete ossification of the epiphyses has taken place, their maximum height is reached, the normal child, however, continuing to grow until the nineteenth or twentieth year, soon catches up and passes in height the child with precocious maturity. Thus Lenz, in reporting his case, states that his patient, when fourteen years of age, had not increased in height for four years and that her older sister, whom she had once passed in growth, is now the taller. Cushing ("The Pituitary Body and Its Disorders," 1912), in referring to the observations of Tandler, says "that the normal individual in whom adolescence has occurred at an early age remains, as a rule, short limbed, whereas those with a tardy adolescence are long limbed. In other words, early sexual development indicates early closure of the epiphyses; delayed puberty (of which artificial eunuchism represents the extreme example) suggests delayed epiphyseal union."

It is of interest to note that these cases are matured functionally as well as anatomically. The fact that menstruation is present would not in itself be sufficient evidence that ovulation takes place; however, we know from autopsy that the ovaries show changes due to ovulation and, besides this, we have records of pregnancy occurring in 11 of these individuals (Lenz, Arch. f. Gynak., 1913, Vol. XCIX., p. 67) which is evidence enough of sexual function. The breasts, too, are found on examination to contain glandular tissue and lactation follows pregnancy.

Sexual desires appear to come at a relatively longer period after puberty than in normal individuals; however, these desires, in the majority of cases, do appear at an early age. This proves to be a most unfortunate side of the condition, as the mentality of these children, keeping pace with their years, rather than their development, increases the danger of their moral life.

As to prognosis, the ultimate outlook is not very favorable; because of lowered resistance from their rapid growth they appear to be particularly susceptible to intercurrent diseases, especially the exanthemata and tuberculosis, and a number have died from neoplastic growths of the ovaries or brain. In a few the symptoms of maturity are said to have disappeared, while some have lived their lives out in a perfectly normal manner.

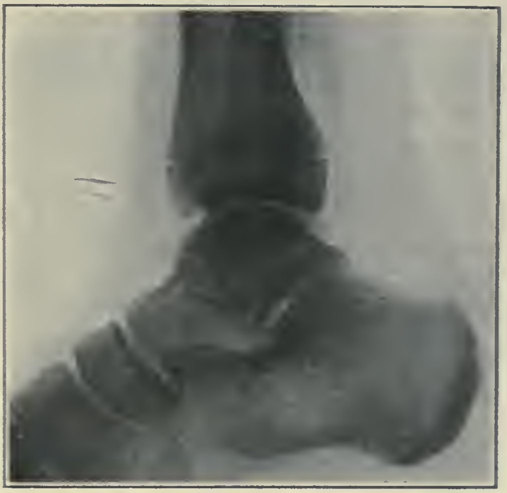

FIG. 5. Roentgenogram of ankle joint

A condition which may be mistaken for precocious maturity is one of abnormal development said to be due to hyperplasia of the adrenal cortex. Jump, Bates and Babcock (American Journal of Medical Sciences, 1914, Vol. CXLVII., p. 568) have recently reported such a case and collected 17 others from literature; they find it occurs more commonly in girls than boys, being reported fourteen times in the former and but four times in the latter.

There are two types—the precociously obese, found in both sexes, and the muscular, or "infant Hercules," which is only found in the male. (Guthrie and Emery, London Clinical Society Transactions, 1907, Vol. XL., p. 175.) The symptoms which characterize it are an abnormal differentiation, development of masculine characteristics at the expense of the feminine in the female, and intensification of the masculine characteristics in the male. Thus the girl develops a deep voice, shows an overgrowth of fat, dense growth of hair on the pubes, in the axilla, on the face and on the abdomen. The skin becomes harsh and dry, at times it may be pigmented and acne often develops. The changes of the genitalia resemble those of pseudohermaphroditism, the clitoris and labia are hypertrophied, while the vagina remains in its infantile state. Development of the breasts and menstruation occurred in but one of the cases (Bulloch and Sequire, Transactions of Pathological Society, London, 1905, Vol. LVI., p. 189), and she was ten years of age. Tumors of the adrenal cortex, "hypernephromas," have been found associated with most of these cases. (None of the authors mentions the condition of the bones.) From this it may be seen that though marked developmental changes take place they do not resemble those of normal adolescence and consequently these cases cannot be classified among those of true precocious maturity.

Gigantism from hyperactivity of the hypophysis cerebri should be easily differentiated from precocious maturity, as the former is characterized by exceptional growth, due to persistence of the epiphyseal synarthroses, while in the case of the latter ossification is accelerated, the epiphyseal line disappearing at an earlier age than normally.

Precocious maturity has been attributed to a large number of conditions, among which I feel the following may be dismissed without further remarks, as we have no evidence that they contribute directly to its etiology—heredity, atavism, overnutrition of the mother, hydrocephalus, precocious libido, pelvic congestion, measles, tuberculosis and rickets.

A number of cases have been reported in which new growths of the genitive gland have been found at operation or autopsy. (Guthrie and Emery, London Clinical Society Transactions, 1907, Vol. XL., p. 175.) (Hofacker, Centralbl. f. Gynak., 1898, Vol. XXII., p. 1,120.)

Neuman (Monat. f. Psychiat., 1901, Vol. LX., p. 337), in 1901 reported 22 cases of precocious maturity associated with tumors of the pineal gland; 19 were in boys and 3 in girls. Since then, Morse (ARCHIVES OF PEDIATRICS, 1913, Vol. XXX., p. 179) has brought together 5 additional cases, all in boys. In the cases due to this condition symptoms of intracranial pressure are present in addition to those of early adolescence.

Cushing ("The Pituitary Body and Its Disorders") reports several cases of sexual and somatic precocity associated with what he considered a hypersecretion of the hypophysis.

From the recently acquired knowledge of the glands of internal secretion, it seems highly probable that precocious development may be directly due to premature activity of the genitive gland, either primarily (that is, a hypersecretion due to intrinsic factors, such as new growths), or secondarily by some change or changes in the other glands of internal secretion, which because of their relationship to the genitive gland cause a premature activity of the latter.

That other glands of internal secretion at times directly influence development and growth cannot be denied; however, it is reasonable to suppose that the symptom-complex of precocious maturity is due to an activity of the sexual gland, because of its similarity to the changes which take place in the organism at the time of normal puberty. It has been proven conclusively that the changes at puberty (including sexual and somatic) are due to the internal secretion of the testes or ovaries. (Tandler and Gross, Wien. klin. Woch., 1907, Vol. XX., p. 1,596, and Wien. klin. Woch., 1908, Vol. XXI., p. 277.) (Griffith, Lancet, 1895, Vol. I., p. 791.) Lately numerous writers, among whom may be named Bouin and Ancel (Arch. de Zool. Exper., 1903, Series 4, Vol. I., p. 437, and Jour. de Physiol. et de Path. Gen., 1904, Vol. VI., p. 1,012), Reinke (Arch. f. Mikroscop. Anat., 1896, Vol. XLVII., p. 34) and Haynes (Journal of Experimental Medicine, 1911, Vol. XIII., p. 338) have shown that in the testicle the interstitial cells described by Leydig (Ztschr. f. Wissensch. Zool., 1850, Vol. II., p. 1) are responsible for the development of the secondary sex characteristics and that their activity is entirely independent of the condition of the germinal cells. Thus in double cryptochids the seminiferous tubules are found decreased in number and the germinal layer of the cells atrophied, the animal being sterile; on the other hand, the interstitial cells are normal and the animals develop all their sexual characters and desires. Bouin (Rev. Med. de L'Est., 1902. Vol. XXXIV., p. 465) and Limon (Arch. d'Anat. Micr., 1902-03, Vol. V., p. 155), whose work has been confirmed by Cohn (Arch. f. Mikroscop. Anat., 1896, Vol. XLVII., p. 34), describe interstitial cells of the ovary, which are thought to be analogous to those of Leydig in the testicle. Cushing ("The Pituitary Body and Its Disorders," p. 279), through the study of clinical cases, comes to the following conclusion: "The glandular element which is responsible for the physical changes of puberty differs from that which is concerned with ovulation and reproduction and may possibly be a function of specific interstitial cells." The activity of these cells in producing a secretion which influences body development is confined normally to the periods of intrauterine life and adolescence; that is, beginning somatic sex characteristics are produced in embryonic and fetal life through the activity of the interstitial cells. During childhood, these cells becoming dormant, no new sex characteristics are formed, though those already present continue their growth; however, with the onset of puberty the interstitial cells reach their highest development and produce a secretion which brings out fully the secondary sex characteristics of the individual. (Biedl, "The Internal Secretory Organs") Thus the time of appearance of sexual maturity depends entirely upon the time of onset of activity of the genitive glands, during pre-adolescence; any factor producing early activity causes the onset of early puberty. The period of non-activity of this gland, which is represented by the time of childhood is shortened or entirely absent in cases of precocious maturity, the individual often passing directly from infancy into maturity. (Lenz, Arch. f. Gynak., 1913, Vol. XCIX., p. 67.)

The fact that a number of cases of precocious maturity have been associated with new growths of the sexual glands is strong evidence that activity of these glands may be produced by some intrinsic factor; added to this are the reports of 3 remarkable cases of precocious maturity in which, after the removal of the gland containing the neoplasm, somatic development ceased and the sexual functions became dormant.

Lucas (Transactions of Clinical Society, London, 1888, Vol. XXI., p. 244) reports a girl of seven years who commenced to menstruate a few months before he saw her. The forced development of the child made her present a very peculiar appearance, for the contrast of the height and figure with enlargement of the mammæ gave her a dwarf-like stature. The mammæ were well developed and firm, the mons veneris was prominent and covered with hair, and in the lower abdomen a hard, round mass could be felt. At operation, a tumor of one of the ovaries was removed, which was reported by the pathologist as a round cell sarcoma. After this operation, menstruation ceased and much of the prominence of the breasts is said to have disappeared.

Brohl (Zentralbl. f. Gynak., 1897, Vol. XXI., p. 113) saw a girl of seven years with precocious menstruation and a mature development. A large cystic ovary was removed, after which she was kept under observation for two years, during which time there was no further menstruation.

Sacchi (Riv. Sper. di Freniat., 1895, Vol. XXI., p. 149) describes a boy nine and one-half years of age, whose body was developed extensively; the right testicle was of enormous size, the left was atrophied. The former, on removal, was found to be an epithelial growth. After the operation the boy became more child-like in appearance.

That the activity and function of the sexual glands is influenced by other organs of internal secretion can be shown both experimentally and clinically.

Thus the function of the pituitary body is intimately related to the sexual gland, as shown by experiments performed by Cushing ("The Pituitary Body and Its Disorders") upon dogs. In cases where puppies survived operation for partial hypophysectomy it was found that they did not develop secondary sexual characters and they were sexually inactive, with an actual atrophy of the reproductive glands. It is also stated by the same author that subsequent to partial hypophysectomy in puppies there was a notable and permanent diminution in the number of interstitial cells of Leydig in the testicle and that many of them showed fatty changes. This author also reports 4 clinical cases as examples of imperfectly acquired secondary sexual characteristics due to hypophyseal lesions which antedated puberty, and 4 other cases with retrogressive sexual changes, when the pathological condition of the hypophysis developed after the acquirement of adolescence. Castration during pre-adolescence is known to result in the hyperplasia of the pituitary and during pregnancy, when the interstitial cells of the ovaries are said to be inactive, there is an increase in the size of the hypophysis. (Vincent, "Internal Secretions and Ductless Glands.") These facts are of great interest in showing the close relationship between these two glands and suggest rather strongly that the pituitary body influences the activity of the reproductive glands.

To the pineal gland, by means of a hormone, has been ascribed the function of inhibiting the activity of the sexual glands during the period of childhood, as tumors of it are said to produce precocious development in young subjects. (Vincent, "Internal Secretions and the Ductless Glands.") However, McCord (Journal of American Medical Association, 1914, Vol. LXIII., p. 232), by means of feeding experiments upon chickens, guinea pigs and dogs, comes to the following conclusions: "That the administration of minute quantities of pineal tissue from young animals to young animals stimulates rapid growth of the body, but not beyond normal size." In other words, this author believes that the pineal tissue of young animals is a stimulant to the internal secretions of the genitive gland. Whether the hormone of the pineal gland is inhibitory or stimulating in its action to the reproductive gland need not be discussed at this time, but that pathological changes in its secretion may produce the symptoms of precocious maturity is quite evident from the fact of it often being associated with these cases.

Quite recently the secretion of the thyroid gland has been brought prominently to our attention as a cause of differentiation of the body. Gudernatsch (Arch. f. Entwecklingsmechn. d. Organ., 1912, Vol. XXXV., p. 457, and American Journal of Anatomy, 1914, Vol. XV., p. 431) has shown that by feeding tadpoles upon thyroid gland the differentiation into frogs was greatly hastened, but that the feeding of thymus gland produced excessive growth without differentiation. From this he concludes that there are two separate factors at work in the body—one of differentiation and another of growth. In addition, we see in the cretin an undeveloped individual, due to the lack of secretion of the thyroid gland, which shows quite evidently the necessity of this secretion for development.

That the secretion or lack of secretion of the hypophysis, pineal or thyroid glands acts directly upon the body producing precocious or retarded maturity, seems quite improbable. But as we know these glands are intimately related to the reproductive glands and that changes in the latter may be followed by hypertrophy or atrophy of one of the former, why should not a change in the secretion of one of the former produce hyper- or hypo-activity of the functions of the latter? And as it has been proven beyond a doubt that the advent of the primary and secondary characteristics are directly dependent upon the activity of the reproductive glands, why should not the lesions of the gland whose hormones influence the reproductive glands cause indirectly the symptoms of precocious maturity?

Granting this to be true, we may assume that the case of precocious maturity reported in this paper may be due to a secretion of the interstitial cells of the ovaries stimulated to premature activity by the pituitary body, which appears to be hypertrophied, as shown by the enlarged sella turcica seen in the Roentgenogram.

As for the treatment of precocious maturity, it is seen to depend entirely upon the primary cause of the condition. If a neoplasm of the ovary is present the indication is to remove it. In pituitary disease exploration is possible, as operations upon the hypophysis are increasing in number with the improvement of diagnosis and cerebral surgery. However, where the condition is due to tumor of the pineal gland little help can be given, for surgery as yet has not advanced to the point where this region can be safely exposed. In time we may be able to do much for precocious maturity by means of glandular extracts, but as yet we have not sufficient knowledge of the ductless glands to attempt the use of their secretions in this condition.

SUMMARY AND CONCLUSIONS.

(1) The symptoms of precocious maturity in the female are the early onset of the changes due to puberty. The changes manifested are both anatomical and functional, but the mental development does not keep pace with the somatic.

(2) Abnormal development in children associated with tumors ("hypernephromas") springing from the cortex of the adrenal gland cannot be considered as true cases of precocious maturity.

(3) Precocious maturity is due to conditions affecting the internal secretion of certain of the ductless glands. It is probably caused by the premature activity of the interstitial cells of the ovaries, which activity is produced either by some intrinsic factor or by the effect of a hormone from the hypophysis cerebri, pineal gland or possibly thyroid.

THE CUTANEOUS TUBERCULIN TEST IN CHILDREN OF NON-TUBERCULOUS PARENTAGE *

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It has repeatedly been stated that the frightful proportion of infections with tubercle bacilli observed in large industrial cities of Europe does not exist in the United States and for this reason clinicians, especially pediatrists, have placed great reliance on the diagnostic value of the cutaneous tuberculin test. Here, it has been said, the number of children infected with tuberculosis, with or without showing clinical symptoms of the disease, is much less than in Europe, and therefore when the tuberculin reaction is found positive in a child the chances that it is clinically tuberculous are immense. It is, however, a fact that hardly any extensive investigation has been made in this country as to the incidence of tuberculous infection among persons at different ages to ascertain the proportion that react to tuberculin; nor has there been reported extensive series of autopsies on persons who died from all causes as to the proportion showing evidences of active or healed tuberculosis after death. In an investigation made by the present author[1] two years ago it was elicited that in children of tuberculous parentage the percentage showing positive reactions to the cutaneous tuberculin test was about the same as that reported in Europe. At present I am in a position to report about a similar investigation among children of non-tuberculous parentage.

During the past summer I applied the tuberculin test to 588 children under fifteen years of age, in whose homes there was no known active tuberculous person. The aim was to ascertain whether it is only the child raised in a tuberculous mileu that runs the risk of infection with tubercle bacilli, while children living under similar social, economic, hygienic and sanitary conditions, but whose parents are not tuberculous, escape infection.

The children in 177 families were thus investigated. These people were all dependents, having applied for relief to the

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United Hebrew Charities. They lived in 536 rooms, averaging three rooms per household. Altogether, they constituted 832 persons, of which 783 lived at home. The congestion was thus as high as is to be expected in families whose bread-winner is either dead or incapacitated, temporarily or permanently. They lived in the tenement district of this city, mostly in the East Side and the Bronx.

We succeeded in applying the von Pirquet test to 588 children under fifteen years of age, using pure old tuberculin for the purpose. Inasmuch as most of the parents objected to repeated "vaccinations" we only applied the test once in each case, and not twice or even three times as was done with the children descended from tuberculous stock reported one year ago. This fact is to be borne in mind when the two groups of children are compared.

The following table shows the ages of the children and the number and proportion giving positive or negative reactions:—

		POSITIVE		NEGATIVE	
Age	Number	Number	Per Cent.	Number	Per Cent.
Under 6 months ...	22	1	4.54	21	95.46
6 to 12 " ...	34	5	14.71	29	85.29
2 years	39	13	33.33	26	66.67
3 "	36	14	38.89	22	61.11
4 "	44	19	43.18	25	56.82
5 "	51	24	47.06	27	52.94
6 "	55	29	52.73	26	47.27
7 "	45	27	60.00	18	40.00
8 "	45	28	62.22	17	37.78
9 "	40	27	67.50	13	32.50
10 "	43	30	69.77	13	30.23
11 "	35	22	62.86	13	37.14
12 "	44	29	65.91	15	34.09
13 "	35	27	77.14	8	22.86
14 "	20	15	75.00	5	25.00
Total	588	310	52.72	278	47.28

Inasmuch as none of these children were seriously sick at the time the tuberculin test was applied, it is remarkable that such a large proportion showed positive reaction. Of the 588 children, 310, or 52.72 per cent., were “reactors.” I feel confident that if the tuberculin test had been applied a second time to those who did not react, the proportion of positive reactions would have been increased by 10 to 20 per cent. It is also to be noted that during the first six months of life the proportion of “reactors” is insignificant—only 1 among 22 infants. During the following six months the proportion rises and we obtained 14.71 per cent. of positive reactions. At two years of age the percentage rises to 33.33; at five years of age even 47 per cent.; and at ten years of age 69.77 per cent. Finally, at fourteen years of age, we found 75 per cent. of positive reactions.

PERCENTAGE GIVING POSITIVE REACTIONS AMONG

	CHILDREN OF TUBERCULOUS PARENTS		CHILDREN OF NON-TUBERCULOUS PARENTS	
Age	Number of Cases	Per Cent.	Number of Cases	Per Cent.
Under 1 year	33	15.15	56	10.07
1 to 2 years	49	55.10	39	33.33
3 “ 4 “	90	68.88	80	41.25
5 “ 6 “	95	65.26	106	50.00
7 “ 10 “	244	71.31	173	64.74
11 “ 14 “	181	74.58	134	69.40
14 “	37	83.79	20	75.00

It appears from this table that the difference between the two groups of children is not as great as would be expected *a priori.* Before the sixth year of life the number infected among those who live with tuberculous parents, where the opportunities for infection are immense, and in overcrowded houses obviously unavoidable, the proportion of infected children reaches 50 per cent., as against 65 per cent. among the group of tuberculous parentage. From seven to fourteen years of age the proportion of “reactors” is about the same in both groups. The slight difference between the two may be ascribed to the fact that in the group of children of tuberculous parentage the tuberculin test was applied two or three times in those who gave negative reactions at the first and second application.

There are several problems to be discussed in connection with these findings. It is of immense interest to know whether the positive outcome of the cutaneous tuberculin test is a sure indication of infection with tubercle bacilli; if so, how have these children, living in homes in which there were no known consumptives, become infected with the tubercle bacilli; and, finally, what is the outlook for these children; are they destined to suffer from clinical tuberculosis sooner or later?

While there are many problems yet to be solved in regard to the specificity of the cutaneous tuberculin reaction, there appears to be no doubt that in practically all cases in which it was found positive, tuberculous changes have been found in some part of the body at the autopsy. The few cases in which the autopsy has not revealed macroscopic changes do not militate against this view because slight lesions may have been overlooked, and would have been found by a microscopic examination of all the tissues of the body, which is not a feasible procedure.

The remarkable agreement in the number and proportion of individuals who react to tuberculin and show tuberculous changes in some parts of their bodies speaks in favor of the specificity of the reaction. When we compare the facts ascertained by pathologists, who, while making autopsies on persons that died from any cause, make efforts to discover any signs of active or healed tuberculous lesions, we are struck with the regularity with which the proportions agree. Thus at birth tuberculous lesions are extremely rare; in fact, when found they are considered medical curiosities. During the first five years of life the percentage showing tuberculous lesions after death is small. In this country Martha Wollstein[2] reported 16.4 per cent. of tuberculous changes among 1,131 autopsies performed at the Babies' Hospital at New York City, and in a more recent paper[3] on the subject she reports again on 1,320 autopsies with 13.5 per cent. of tuberculous changes. The proportion found in Europe is even higher. Naegeli's[4] investigations along these lines are well known. He found but few showing tuberculous changes during the first five years of life, while between the fifth and the fourteenth years more than one-third of the bodies that came to autopsy revealed tuberculous lesions, active or latent; at twenty, over 90 per cent. were thus affected.

Burkhardt's[5] findings were the following: Newborn infants never show tuberculous lesions; during the first five years of life the proportion reaches 28 per cent., while after the fifth year the percentage keeps on rising, reaching 87 per cent. at fourteen. Similar figures have been obtained from the autopsies reported by Beitzke[6], Hamburger and Sluka,[7] and others. In a recent paper on this subject Lubarsch[8] shows that of 7,371 necropsies, 4,230, or 57.4 per cent., showed tuberculous lesions, while of 5,796 adults that came to autopsy 4,017, or 69.2 per cent., had had tuberculosis at some time during life.

It is noteworthy in this connection that Laennec[9] had already noted the frequency of tuberculosis during childhood eighty years ago in Paris. At the children's hospital in that city autopsies made in 1830 showed tuberculous lesions in the vast majority, but these findings have been forgotten till Naegeli[4] rediscovered this fact in 1890, and the difference of opinion at present is merely whether only 60 per cent. of adolescents are affected with tuberculosis, or as many as over 90 per cent. The latest report on this fascinating subject is that of Harbitz,[10] who made careful autopsies on 484 children and found that during the first year of life 10 per cent.; during the second year, 26.2 per cent.; third and fourth year, 31.8 per cent.; fifth and sixth years, 67.9 per cent.; seventh to tenth years, 79 per cent.; eleventh to fourteenth years, 86 per cent., while during the fourteenth year, 85 per cent. showed lesions of active or latent tuberculosis. It is thus evident that these percentages are about the same as revealed by the application of the von Pirquet tests to the living.

In my paper on "The Child in the Tuberculous Milieu"[11] I have collected many facts about the tuberculin test, showing that wherever it was applied to a large number of children the proportion of positive reactions was invariably over 50 per cent. The difference between those who lived in tuberculous milieu and those who had had no contact with consumptives in their homes, is apparently insignificant. This was evident from the investigations of Cohn,[12] Calmette,[13] R. Pollak,[14] and many others. The most recent reports on this subject are those of F. Amenta,[15] who applied the von Pirquet test to 800 children in whom no clinical indications of tuberculosis could be discovered. He found that under six months 17.5 per cent. reacted positive; six to twelve months, 30 per cent.; one to two years, 28 per cent.; two to four years, 47 per cent.; four to six years, 72 per cent.; six to eight years, 75 per cent.; and eight to ten years, 83 per cent. Ina Rosquiet[16] tested 372 children under fifteen years and found an average of 69.3 per cent. of positive reactions. Among those under one year old 61.3 gave positive reactions, while those seven years of age showed 77.1 per cent. of "reactors." The nature of the material explains the high proportion of infected during the first year. They were all brought up in a tuberculous milieu, and descended from tuberculous parents. There the proportion is even higher than among the children of tuberculous parentage which the present author investigated two years ago.

The large proportion of infections with tuberculosis among the children reported on in this paper is not surprising, even if their parents have not shown any clinical evidences of active tuberculosis. The opportunities to meet tuberculous persons, especially "carriers" of tubercle bacilli, without showing any symptoms and signs of the disease, are very great in the tenement districts of New York City. We have no data as to the frequency of infections among the well-to-do in this city, because no one has ever to my knowledge reported a large series of children of this class to whom the von Pirquet test was applied. But to judge from my personal experience, as well as from facts to be soon mentioned, I am under the impression that even the rich, raised in healthy and capacious dwellings with all possible care to prevent infection, have a large proportion in whom the von Pirquet test is positive. Even if they are safe at home they are bound to become mildly infected when sent to school; and on reaching adolescence, and coming in contact with all kinds and conditions of people, they cannot escape infection.

In a previous paper on the subject I have given details of Jakob's[17] and of Hillenberg's[18] findings in rural communities in Germany, where no active tuberculous person has been known for long years, yet the proportion of children reacting to tuberculin was between 25 and 45 per cent. A more drastic example has recently been published by Birger Overland.[19] In an isolated valley in the mountainous district of Scandinavia, where no death due to tuberculosis has occurred for many years, Overland applied the von Pirquet test to all of the 100 inhabitants, and found that 54 per cent. reacted positive. A careful investigation revealed the following clinical cases of tuberculosis:—

(1) A young woman of twenty-six suffered from lupus since childhood. (2) A thirty year-old man had one of his fingers amputated because of a tuberculous affection. (3) Two cases of abscess, probably of a tuberculous character, and one of phlyctenular eye affection.

From his investigations Overland considers the tuberculosis in that settlement as imported by two teachers in the village school. Bovine infection with milk was excluded by testing all the cows with tuberculin.

If a teacher in a village school can infect the majority of the children in a rural settlement, where the outdoor life and economic conditions might be expected to prevent the dissemination of the infective agent, life in tenements, in poverty and want, involving more or less intimate association with many consumptives, or tubercle bacillus "carriers," which are abundant in cities, in public schools, etc., should make infection unavoidable. And so it is in large cities.

To avoid misapprehension it must be stated that all available evidence tends to show that these infections during childhood are altogether harmless in the vast majority of persons. The fact that so many give positive reactions to tuberculin and yet are healthy, is sufficient proof that infection with tubercle bacilli alone is not sufficient to cause phthisis. The large number of healed, latent and quiescent tuberculous lesions show conclusively that in most persons tuberculosis heals spontaneously. In fact, it appears, as was shown by the present author in another place,[20] that these mild lesions are not only innocuous, but even beneficial, inasmuch as they protect the individual from exogenous reinfection with tubercle bacilli. Persons who have not undergone a mild infection during childhood, when infected with tubercle bacilli are apt to develop hematogenic tuberculosis of a rapidly fatal type—tuberculous meningitis, acute miliary tuberculosis, acute pneumonic phthisis, etc. This is actually the case with infants, or peoples who have not been exposed to infection during childhood, and all others who offer virgin soil to the tubercle bacilli. Chronic phthisis is rather a sign of immunity; only the most vulnerable organ, the lung, is affected, and this organ is only rarely affected in this manner in those who have not been "vaccinated" with tubercle bacilli during childhood.

Resumé.—Among 588 apparently healthy children of non-tuberculous parentage, 52.72 per cent. gave positive reactions to tuberculin. During the first year of life the proportion of "reactors" is small and insignificant. From one to two years of age, 33.33 per cent. reacted; between three and four years of age, 41 per cent.; between five and six, 50 per cent.; between seven and ten, 64.74 per cent.; between eleven and fourteen, 69.4 per cent.; and at fourteen years of age 75 per cent. showed evidences of having been infected with tubercle bacilli.

It appears that the cutaneous tuberculin test is quite reliable in showing whether a person has been infected with tubercle bacilli or not. It is, however, of little value in the diagnosis of the disease known as tuberculosis in its various manifestations. It appears that in large cities like New York, and even in small rural communities, most of the children have been infected with tubercle bacilli before reaching adolescence, though they have not necessarily suffered as a result of this infection.

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STREPTOCOCCUS MENINGITIS WITH REPORT OF A CURED CASE

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AND

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On September 4, 1913, we were called to St. Vincent's Hospital to see a case of meningitis presenting the following history:

T. F., age twenty-six years, admitted to the hospital August 30th, complaining of very intense headache. Family and past history negative. On August 20th earache had begun following bathing in surf. August 23d went to New York Eye and Ear Infirmary, was told he had abscess of left ear and paracentesis was performed. He went to his home feeling pretty well, but the next day, August 24th, began to have headache. He went back two or three days later and was told he was all right. He came to St. Vincent's August 29th complaining of headache. Was given calomel and sent home. Was admitted August 30th.

Physical Examination.—Rigidity of neck, later opisthotonos; positive Kernig; knee-jerks present; pupils large, equal, react to light and accommodation; slight internal strabismus of both eyes, some nystagmus in left; pulse and respiration rapid; abdomen rigid; extremely hypersensitive; tremulous all over.

August 31st, lumbar puncture, 20 c.c. cloudy fluid under pressure; heavy sediment, globulin positive; cells increased, practically all polynuclears; no bacteria in smear or culture. Urine, trace of albumin, few hyalin casts.

September 1st, blood count, 14,500 white blood cells, 84 per cent. polynuclears.

September 2d, blood count, 15,000 white blood cells, 86 per cent. polynuclears. Second lumbar puncture, 30 c.c. fluid.

September 4th, seen by meningitis department of Board of Health. Condition much the same as in the original physical examination. Patient delirious, had been so since September 1st; Macewen present; very slight reaction of pupils to light; temperature, 105°; pulse, 110, slightly irregular; respiration slow. A lumbar puncture was done and 20 c.c. cloudy, yellow fluid was drawn. As no organisms had been demonstrated in previous fluids, 15 c.c. of antimeningitis serum was administered. An examination of this fluid showed the streptococcus pyogenes in smear and culture. It was accordingly recommended that antistreptococcus serum be administered both intravenously—as streptococcus infections are likely to be generalized—and intraspinally. Also that streptococcus vaccine be given.

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* From the Bureau of Laboratories, Department of Health, New York City.

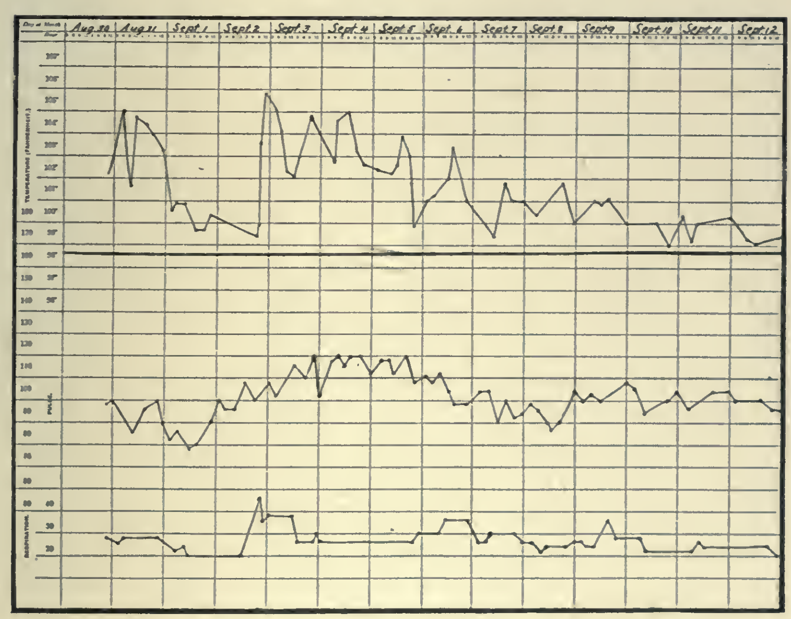

Fig. 1. Temperature, Pulse and Respiration Curves of T. T.

September 5th, lumbar punture, about 40 c.c. of fluid withdrawn and about the same amount of antistreptococcus serum administered. This fluid was examined by us and also showed streptococcus pyogenes in smear and culture.

September 6th, 40 c.c. antistreptococcus serum given intravenously.

September 7th, 1,000,000,000 streptococcus vaccine given—the large dose was due to a misunderstanding, but no bad results followed.

September 8th, 40 c.c. antistreptococcus serum given intravenously.

After September 5th some little difficulty seems to have been met by the interne in doing the lumbar puncture, so no more were done and we were not called to see the case, as he seemed to be improving under the treatment.

On August 31st, urotropin was begun—30 grains per day. This was increased three or four days later to 120 grains per day, and was continued until September 14th, when the urine began to show pus. The urotropin was then cut down to 30 grains per day until the temperature became normal, September 20th.

The patient left the hospital October 6th in very good condition, except for a slight tremulousness. About two weeks later some pain in the back developed and the patient returned to the hospital November 4th, complaining of pain in the back and along the sciatic nerves. Under the action of salicylates and counter-irritants, the pain cleared up, but the impaired sensation and weakness existed for some time. The case was discharged improved in January. Neuritis following meningitis happens occasionally.

Recoveries from streptococcic meningitis are extremely rare. A careful search of the literature reveals but three.

Alexander[1] reports a case of chronic suppurative otitis media complicated by purulent labyrinthinitis and subdural abscess and pachymeningitis in which lumbar puncture revealed a purulent fluid with streptococcus in smear and culture. A radical operation, opening the vestibule and incision of the dura, was followed by recovery. Alexander claims that this is the first case of undoubted healed streptococcic meningitis.

A. Netter[2] reports a case of a child of seven with double otitis media complicating measles in July, 1900. Two punctures were done and the streptococci were cultivated from spinal fluid. The child recovered with no sequelæ. No medication was mentioned. Netter advises the use of lumbar puncture, warm baths and intravenous injections of colloidal silver.

Tedesco[3] reports a case of a girl twenty years old who was sick April 12, 1911. Headache, Kernig, strabismus, optic neuritis on both sides. A lumbar puncture April 16th showed pus and streptococci by culture. The pressure was greatly increased.

April 19th, a second puncture showed a sterile fluid under less pressure. The patient went on to recovery.

Holger Mygind,[4] of Copenhagen, reports cure by operation of 6 cases of otitic meningitis, but does not state the nature of the infection. The gravity of streptococcus infections is generally recognized. Lermoyez, in 1908, states that while cases of otogenic meningitis due to staphylococcus and pneumococcus sometimes recover, after operation, streptococcus meningitis never does. Körner also claims that streptococcic meningitis is incurable. Of course, these claims are now controverted, but they serve to show how serious this infection is.

During the past four years we have seen 18 cases of streptococcic meningitis, of which only the one described above recovered. Five of these were due to streptococcus mucosus capsulatus—considered by most as belonging to the pneumococcus group, the rest to the streptococcus pyogenes group. In 2 of the cases the histories were lost. Of the remaining 16 there was no history obtainable bearing on the condition in 5 cases; 5 cases gave a previous history of middle ear disease or mastoid; 2, of scarlet fever, middle ear and mastoid; 1, of operation on the nose; 2, of trauma of the head; 1, of whooping-cough. Of these cases 7 received antistreptococcus serum, 5 receiving more than one dose intraspinally, intravenously or both. One of these recovered, as reported, and the other 4 showed considerable temporary improvement, though 3 were seen six days or more after the onset of symptoms. The fluids, too, showed improvement, the organisms becoming more and more intracellular and in 1 case diminishing in numbers.

The fourth case is deserving of a little special consideration. The child, H. W., eight years old, was convalescing from scarlet. Otitis media developed, and, on October 26, 1913, an operation for mastoid was performed on the right side. She was seen October 28th. A lumbar puncture had just been done by the interne and our examination had revealed streptococci, so 5 c.c. of serum was given intraspinally, 20 c.c. subcutaneously and 100,000,000 streptococcus vaccine was injected. On October 29th the condition was somewhat better—15 c.c. of very cloudy fluid was removed by lumbar puncture, 10 c.c. of serum was injected intraspinally and 20 c.c. subcutaneously. This fluid showed phagocytosis of the streptococci and a slight diminution in numbers.

On the 30th, the otologist in charge of the case decided to do a radical operation and try drainage through the skull and requested that the lumbar punctures be discontinued. On November 1st the child was very much worse and lumbar puncture was again requested; 20 c.c. of very cloudy fluid was withdrawn, 15 c.c. of serum was injected intraspinally and 20 c.c. subcutaneously, and 150,000,000 of vaccine was given. On November 2d and 3d lumbar puncture was performed and the serum was injected both intraspinally and subcutaneously. While some improvement was noted November 2d, it did not continue and the patient died on the 3d. It is to be observed in this case that the operative measures failed to give adequate drainage. While it is very probable that the patient would have died in any event, there was some improvement with the use of lumbar puncture and serum and vaccine therapy, both in the clinical condition and in the laboratory findings of the fluid. It is interesting to note that of the 4 cases of cure only 1 had undergone operation.

In Archives of Pediatrics, February, 1913, Dr. Irving S. Haynes, in the "Treatment of Meningitis by Drainage of the Cisterna Magna," urges strongly surgical interference in septic meningitis, even in epidemic meningitis, if improvement does not follow in twenty-four hours after the first administration of serum. In discussing the diagnosis of meningitis and the indications for operation, he says: "Kopetsky was the first to demonstrate that the disappearance of sugar from the cerebrospinal fluid was an invariable result of bacterial infection, that the absence of sugar could be determined before the bacteria themselves could be found and, further, that in conditions simulating meningitis, but not caused by bacterial infection and which did not eventually result in meningitis, the sugar did not disappear from the fluid."

With the statement that the sugar invariably disappears from the cerebrospinal fluid in bacterial infections and that its absence may be demonstrated before the presence of the bacteria we strongly disagree. In an examination of over 1,050 fluids we have never seen an instance in which the disappearance of sugar from the fluid preceded the appearance of organisms except in a few instances of apparently recovering epidemic meningitis where the organisms had disappeared from the fluid, but the sugar had not yet returned. On the contrary, in a fair proportion of fluids there is sugar present, though decreased in amount together with the organisms. For instance, of 88 known tubercular fluids 73 per cent. gave a good reduction, and of our last 117 specimens of purulent fluids 59 gave a reduction. We have observed that fluids that have for any reason not been examined within a few hours after withdrawal are much more likely to show the absence of sugar, and we think this may be a possible reason for the contrary findings of Kopetsky and Haynes. In view of these facts, we consider the presence or absence of sugar of prognostic not diagnostic value, as we have repeatedly observed that it is more likely to be present in favorable or recovering cases.

With the statement that in conditions simulating meningitis, but not caused by bacterial infections and not developing into meningitis, sugar does not disappear from the fluid, we agree in general. We have, however, had one fluid from a case of heat stroke that did not reduce Fehling's, though it was normal in other particulars. The child made an uneventful recovery.

Referring to the absence of sugar from the fluid as a very early sign, Dr. Haynes goes on to say: "Further, I urge that the same method of treatment (surgical) is demanded in the early cases of diplococcic infections as in any of the other varieties, because we do not know at this early hour which germ is present, and when we do know it may be too late to save our patients. The necessary conclusion is that surgical relief must be given in all cases of septic meningitis. Therefore, I maintain that if this first examination shows the loss of a proper reducing agent from the cerebrospinal fluid, but the actual germ is not detected at this examination, the case must be operated on at once. However, if at this first examination the diplococcus of Weichselbaum is detected, then the meningitis serum should be given, a delay of not more than twenty-four hours follow, and if there is no improvement then an operation should be done. Because a second injection of serum may not be entirely harmless, its probability of relieving the disease diminishes with the lapse of time and most serious of all such delay renders futile any surgical effort."

This method of treating ordinary epidemic meningitis we think quite unjustifiable. In cases of basic meningitis, the outcome of which is practically always fatal, it might be tried. It does not seem to us that the beneficial effects of surgical treatment have been demonstrated at all conclusively. Haynes goes on to say: "Unfortunately, all of my own cases have died. This is no discredit to the operation nor does this result invalidate my contentions. These results simply mean that operative relief must be offered at the beginning of the disease. Delay brings disaster."

We cannot see how the fact that late operative measures are unsuccessful proves in any way the value of early operative measures. We have had very little opportunity to try the effect of early lumbar puncture and serum therapy in cases of septic meningitis—but 2 of our own cases were seen before the sixth day. Of these, one recovered, the other was improving under lumbar puncture, but failed rapidly after operative measures were instituted. This operation was not, however, the one recommended by Haynes.

It is certain that meningitis due to any other pyogenic organism than the meningococcus is a very grave disease and the chances of recovery with any method of treatment are exceedingly small. But, as has been already pointed out, of the four known cures of streptococcic meningitis three were with lumbar puncture and one with operative measures.

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Diphtheria of the Esophagus.—J. D. Rolleston (*British Journal of Children's Diseases*, September, 1913) calls attention to the fact that this condition is probably not so rare as is generally supposed, although there are details of only 24 cases on record. In the author's case, a boy of six years, death resulted on the fifth day and the autopsy showed a diphtheritic membranous deposit in the lower portion of the esophagus, in addition to that found in the palate, nasopharynx, larynx and trachea. The author examined 2 additional cases of diphtheria which died in the acute stage in 2 of which an esophageal membrane was present. It is to be noted that, although diphtheria of the esophagus and stomach is usually fatal, 4 cases of diphtheria of the intestines have been recorded, all of which recovered. In those cases of diphtheria of the esophagus which ended in recovery, a stricture resulted.

SOME POINTS IN THE MANAGEMENT OF BREAST FEEDING

BY FRANK VAN DER BOGERT, M.D.
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Unfortunately, though absolute statistics are not available, artificial feeding of babies seems still to be on the increase or, at least, not decreasing to any great extent in spite of the propaganda at the present time so faithfully being carried on by some in favor of the breast.

Undoubtedly there are many instances in which breast feeding is discontinued for good cause, and among these reasons may be mentioned chronic illness, such as tuberculosis, or persistent ill health in the mother, pregnancy, irremediable conditions of the nipple, breast abscesses with pus contamination of the milk, and condition of the child's sucking apparatus which absolutely prohibit nursing. I can think of ~~no~~ other causes which would warrant discontinuance without a most painstaking effort to surmount the supposed difficulties, and many of the cases in which breasts, nipples and sucking apparatus are at fault may still be given the benefit of breast milk through hand-feeding.

Judging from the histories of cases which I see, sufficient efforts are certainly not made to encourage the nursing function and to improve and increase the supply of milk. Some of the reasons which have been given me for removing the child from the breast have certainly been inadequate, not to say ridiculous, and when the seriousness of the matter is considered perhaps justly termed criminal. Only recently I had a woman tell me that she gave up nursing because a certain proprietary food "was the best thing she had ever heard of upon which to raise a baby."

Among the reasons for early weaning taken at random from my case-notes are: loss of weight, refused the breast, wouldn't take it, eruption on face, loose bowels, irritation of the buttocks, colic, very little milk, could have nursed but wanted to feed upon a proprietary food, milk poor in fat, pneumonia in the baby. Many of these were apparently encouraged in their error by their attending physicians. Possibly in all of these cases we could not hope to obtain results by proper management; undoubtedly, however, a very large percentage of them could, by careful and persistent treatment, have been saved the dangers of artificial feeding.

Discussing these various causes seriatim, loss of weight, if continuing over a long period, may probably be considered a sufficient reason provided a well-directed effort has been made to improve the supply. An occasional bottle, however, to supplement the breast, would, in all probability, be a safer means of producing a gain, and in time the quantity and quality of the milk might safely be expected to improve under proper conditions of diet, hygiene and exercise of the mother.

Absence of milk, if total absence ever does occur, is undoubtedly in many instances due to a lack of breast stimulation and the proper method of treatment here is not to take the baby off the breast, but to put it on, tiding over by an occasional bottle or bottles at long intervals, the object of the long intervals being to insure the preservation of a normal appetite and so encourage the baby in its efforts to obtain its natural food.

When a normal baby refuses the breast there is usually something wrong with the milk, and our duty is to improve, by the methods suggested, the amount and quality and so tempt the baby.

An inability to obtain satisfaction from an empty breast and an instinctive knowledge that a bad milk will cause distress are the determining factors.

Skin eruptions, loose bowels, irritation of the buttocks and colic all depend upon an indigestible milk or upon over-feeding, and these objections can, in most instances, be readily overcome by regulation of the life of the mother and the periods and duration of the nursing.

As to the last cause mentioned, pneumonia in the baby, I know of no better way to lessen the chances of recovery. If a sick baby is unable to nurse, by all means keep up the milk supply and feed breast-milk by hand, thus giving the baby the benefit of the most digestible and assimilable food at a time when its powers of digestion are most impaired and when convalescence sets in and the baby is again able to nurse the breast will be able to do its work. Although a good artificial food may be better than a poor breast-milk, yet there is nothing better than a good breast-milk.

Though in practically all cases breast-milk can be improved, naturally we must expect some failures, and many of these failures may, I believe, be attributed to social conditions as they are today.

It is not likely that most mothers deliberately refuse to nurse their babies, but some cannot. Young girls, not many years ago, were encouraged to play with dolls, keep house and cook on toy stoves; today these children play pianos, dance and spend their time reading books far too advanced, and in other unnatural pursuits. The nursing of the doll and toy housekeeping certainly tend toward motherhood.

Proper diet and hygiene of the mother should not be left until after the baby arrives, but should be begun before pregnancy terminates and before pregnancy even occurs. I fail to see how we can expect the anemic type of girl who dines at the soda fountain to be able to nourish both herself and a baby.

An exceedingly common error in feeding the nursing mother, one blamable often to the doctor or nurse, is the common practice of forcing the mother's feeding in the early weeks of the nursing period. My own idea is that three good, nutritious meals, well digested and assimilated, will make far more milk than a half-dozen feedings given so closely together as to clog the digestive tract. It is well to remember that a little food, well assimilated, will do more than quarts which pass through undigested.

Water is undoubtedly of benefit, since the amount of water eliminated is increased, but water or any other liquid should not be given with meals in sufficient quantity to interfere with digestion.

As an instance of this forced feeding of the mother in a misdirected effort to increase the milk supply, I might cite a case which I saw very recently.

The milk supply was practically gone on the eighth day and the baby put upon an artificial food. When seen, the infant had been without breast-milk for six days. The history showed that the mother, during the first week, had been given eight to ten meals daily. The grandmother was exceedingly enthusiastic about the nurse in attendance because she had been so faithful in her feeding of the mother. I am very sorry to disagree. The feeding was apparently forced to an extent which caused poor digestion and very little normal assimilation and so interfered with the development of the milk supply.

The indications in the case, as they appeared to me, were to limit the diet to three good, nutritious meals daily, allowing only water between, and to put the baby back upon the breast, helping out by supplemental feeding. Within two or three weeks the baby was getting two full breast feedings daily.

Restriction of the diet because of fear of upsetting the baby, to the extent to which it is practiced, seems absurd. It is certainly not reasonable to expect a mother to remain normal when practically everything she has been in the habit of eating is taken from her. It is a good rule to allow anything, acid or otherwise, which she knows she can digest without distress. In certain cases, perhaps, stimulants, such as tea and coffee, should be restricted, but probably not absolutely eliminated if habitually taken.

Not long ago a mother told me that she had been advised to eat nothing but potatoes, and when her mother-in-law advised her to stop the potatoes she was a bit discouraged. This was no doubt an exaggeration, but serves to illustrate the point.

A very frequent cause of indigestible milk is too frequent feeding. Even the two or three hour intervals, so commonly advised, should be lengthened, especially where there is vomiting, and the time allowed at each individual nursing should be regulated. It is not the amount swallowed, but the amount assimilated, that counts. The temptation to feed too frequently at night is especially strong and often depends upon the fact that the baby is allowed to sleep with the mother. An infant cannot be expected to resist a breast so easy of access any more than we can expect an alcoholic to resist a bottle in his back pocket.

Constipation in the baby is occasionally noted as sufficient cause for removal from the breast.

Constipation is perhaps more frequent in the breast-fed than in the bottle-fed. It cannot, however, be justly considered an hereditary condition, as might appear from the prevalence of constipation in the nursing mother, but rather due to changes brought about in the milk by autointoxication; the treatment should then be dietetic and hygienic management of the mother.

THE TONSILS AND TUBERCULOUS CERVICAL ADENITIS—G. L. Richards (Boston Medical and Surgical Journal, January 7, 1915) states that it has been repeatedly demonstrated that tubercle bacilli can be made to invade and pass through the faucial tonsil without producing tuberculosis of the tonsil itself. Tuberculous adenitis is not necessarily accompanied by a tuberculous tonsil. The tonsil, however, may be the portal of entry for the infection. The author recommends that in all cases of cervical adenitis the tonsil be removed as the first procedure.—*Medical Record.*

THE IMPORTANCE OF THE MEDICAL SUPERVISION OF OLDER CHILDREN *

BY EDWARD JUDSON WYNKOOP, M.D.
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One has but to keep in touch with pediatric literature to realize the great amount of work that is being done to bring before the public the importance of the proper care and feeding of infants. All over this broad land of ours the people are waking up and something is being done to lessen the needless sacrifice of helpless infants from preventable causes. Infant welfare campaigns, milk stations and summer camps are among the many agencies helping in the work that means so much to us as a nation.

From infancy to school age is a period that until quite recently has not received as much attention as it should have from the medical profession, and parents have not been made to realize how important it was to have these young children kept under proper medical supervision. However, there seems to be a more systematic effort to supervise this period than formerly and some excellent literature has recently been published. But this is only a start and there is much that should make us realize our obligation to these little ones, and should stimulate us to take a more active interest in securing for this period persistent and proper supervision. At school age, medical supervision of the school boy and girl has arrived in this state, and those children attending the public schools will receive a benefit that was long denied their predecessors. Too much stress cannot be laid upon this very important matter, for nothing has such a bearing on the future welfare of the children as their proper supervision and inspection and the early and prompt correction of those processes which tend toward mental dullness and physical enfeeblement. All too well can we recall cases which have reached adult age handicapped by infirmities that should have been corrected in early childhood. How easy, too, it would have been had the first inroads of the disease been discovered early and with a little urging on the parents to have something done promptly, prevented the handicap which has followed all through life. Every effort is being made to conserve our natural resources, and in so doing we must bend every effort to see to it that the health of the children, from birth on, is safeguarded so that they may reach maturity fit mentally, morally and physically.

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* Read before the Pediatric Section of the New York State Medical Society, April 30, 1914.

It is my desire in this short paper to call your attention to that period in the child's life between the ages of ten and fourteen or, in other words, those years leading up to puberty. The approach of puberty may be the beginning of various nervous phenomena, which in themselves are of little importance, but unnoticed and untreated may lead to serious results. The rapidly-growing child approaching the teens is a complex organism of no mean proportions and demands of its parents or guardian resourcefulness, frankness, sympathy and honesty in all its dealings. The field of preventive medicine is constantly widening, but it has been only of late years that its value has been realized and put to practical use. Nowhere does such an opportunity exist as in childhood, especially in those years where the boy and girl are making ready for manhood and womanhood. Rather than attempt to cover this entire field it would seem to me wiser to pick a few special reasons why this period in childhood should be carefully supervised. It seems to me that this period, this border land it might be called, is the most critical of all. The boy and girl at this age are impressionable, easily led and easily influenced, often physically overgrown and awkward, mentally abnormally sensitive and reticent and frequently difficult to manage. These are the men and women of to-morrow. These are the ones that some day will take our places and our duty is plain—to see to it that they are fitted as they should be for the beginning of manhood and womanhood. This is the time to watch the nervous, rapidly growing child, to prevent those serious diseases which may last through life.

Between the ages of ten and fourteen is a fertile period for the development of many functional neuroses. Hysteria in its many forms and a host of other functional nervous disturbances seem to be most active at this time. Then occur, too, many of the early symptoms of the various degenerative changes which are the forerunners of organic diseases of the brain and nervous system. All too well can we recall case after case which should have been detected early, but was not till some serious nerve explosion occurred leaving disaster in its wake. Rheumatism, with its many manifestations, chorea and many other diseases are apt to occur at this period and point out the necessity all too plainly for proper custodianship. This is the period when boys and girls are easily overworked in school and when the hours of sleep are oftentimes much less than they should be.

Late hours is the cause of an enormous amount of damage at this time of life. One has but to visit the various picture shows and entertainments given nightly to see the many children that frequent these various places of amusement. It is almost incomprehensible why the matter of sleep is so neglected. The nervous and irritable boy or girl, constantly on the go, craving more and more excitement, soon has a nervous system that falls an easy prey to almost any vicious habit. Is it the fault of the parents entirely that these late hours among children are so common, or are we negligent in our duty as physicians not to explain to parents and to the children the importance of plenty of sleep? An investigation of the ordinary hours of sleep of many of our little patients would, without doubt, result in many surprises.

At this age the growing boy and girl needs every bit of nourishment it is possible to get to furnish fuel for the rapidly-growing structures. Altogether too little time is spent in explaining to these growing boys and girls the necessity of good nourishment and what is meant by proper food and the correct preparation of the same. Many of these children get enough to eat, but it is the wrong kind of food, often of poor quality and improperly prepared and does not furnish a sufficient number of calories. The question of nutrition at this time of life is very important, more so than we realize, for many times the children who come from good homes are under-fed. How many times in our visits to those sections of the city where poverty reigns have we been struck with the disgraceful waste that is often seen in many of these homes. In the ill-kept flat, poorly lighted and ventilated, it takes but one glance at the littered kitchen sink, filled with half-eaten food and spoiling things, to realize if only a little wholesome advice had been given in regard to health matters and right living early, how much different it all might have been.

There is probably no condition that is so common, especially among girls, as constipation, and this is a habit which, though frequently formed early, is sure to appear in later childhood through neglect. There is nothing which taxes the ability of the physician more than curing constipation in growing girls and boys, with their utter disregard for regularity of habits. The good that can be done in preventing constipation by careful supervision, proper diet, exercise and habits would eliminate one of the greatest evils medicine has to contend with. Oftentimes one has to supervise and regulate the entire household before securing proper coöperation from parents.

The prevalence of the so-called social diseases has astounded almost all investigators, and while many physicians have realized the dangers due to these diseases they have have been at a loss to proceed against them in a rational and effective manner. Whether sex hygiene can be properly taught in the average classroom or lecture hall is an open question, but the personal contact acquired by frequent physical examinations will help to eliminate many of the underlying causes of these social diseases and I believe will be a great aid toward helping to reach some accurate conclusion as to the best means to eliminate these diseases. All educators and investigators now agree that first and foremost comes education and it seems to me now that there is a chance of reaching some of these children through the examination by the school inspectors, a work can be started that will be effective. It is our chance now, as these boys and girls are brought to us, after being referred by school inspectors or parents, to subject them to a good, careful physical examination and explain to them the importance of keeping the mind and body in good order.

These children can be guided in regard to habits of right living by the awakening in the boy and girl of the desire to be strong and well, to make men and women who are fit for the work of this life. It is known to all of us that a sound mind in a sound body is one of the best safeguards we have against all that tends to degrade morals and health. Those of us who have worked in pediatrics for a number of years have but to consult our case records to find how very infrequent it is for us to be consulted in regard to older children except for some acute disease. It is the exception when the children have been brought in for physical examination and good wholesome talk on health matters. The child is advised to seek the dentist at frequent intervals, at least once in six months, and why not the physician to see that the heart and lungs are healthy, the blood and urine normal and that there is no tendency to deformity or disease? Will anyone gainsay the value that this might have on our anemic and constipated girls, our rapidly growing and nervous boys?

Some will say, "Why is so much stress placed on the examination of school children?" For the very reason that already intense interest is being aroused among parents as to the physical qualifications of their children. As a matter of fact, probably only a part of these examinations will be made by the regular school physician, but many will seek their own doctor or someone specially qualified in children's work. This means that never before has such an opportunity presented itself to the medical profession for bringing home to parents and guardians the importance of keeping a close eye on growing boys and girls. It is not at all unusual for us to know instance after instance of those reaching the prime of life, taking every possible precaution to prevent "clay-pipe arteries" and other senile changes. It is not at all an infrequent thing to know of men, keen in business, seeking their physician to get his opinion on their physical condition before entering upon some business venture of great magnitude. Why, then, should we defer our opinion on the human risk to that time of life? Why not begin early in the formative period and prevent many of the tendencies by proper supervision?

The advantages to be gained by the medical supervision of older children are many, but the special points that seem to be uppermost are these:—

First, with the advent of the medical inspection and examination of school children, it is going to be possible for us to get in closer contact and keep under medical supervision a certain proportion of these children. Not all, not as many as we should have; but the importance of this work is going to be so emphasized that parents will realize more fully the needs of their children.

Second, it is going to enable us to keep a closer observation of the growing boys and girls and will, I believe, bring home to the parents as never before a realization of the importance of making it a business to keep their children well.

Third, by starting a closer relationship between the children and their physicians it will give the physician many opportunities to advise parents in regard to the needs of their children.

This period of life has only been mentioned superficially, for it opens up so much that to cover it completely would necessitate a great deal of time. It is my desire to call attention to just a few common points of interest, so that in our enthusiasm over the baby we will not neglect the older child.

SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS

Stated Meeting, Held December 10, 1914

WILLIAM P. NORTHRUP, M.D., CHAIRMAN

PRESENTATION OF CASES SHOWING THE EFFECT OF BLOOD TRANSFUSION IN PURPURA HEMORRHAGICA, HENOCH'S PURPURA, CHRONIC SEPSIS, ETC.

DR. EDWARD W. PETERSON stated that in the hemorrhagic diseases of the newborn human blood serum, whole blood injected subcutaneously, and blood given by transfusion, had a specific action in correcting the dyscrasia. In fact all types of pathological hemorrhage yielded the best results when treated by blood transfusion, or by subcutaneous injections of human serum. Of the two methods the former had proved the more efficacious. After transfusion there was increase in blood pressure, in the number of cells, in the percentage of hemoglobin, and the coagulation time was shortened. Besides being hemostatic, whole blood, administered by transfusion, stimulated the hemopoietic functions, and there was an increased clinical evidence that it was also antitoxic and bactericidal. To illustrate the effects of blood therapy the following cases were presented:—

CASE I. *Purpura Hemorrhagica.*—This patient, four and one-half years of age, was admitted to the Post-Graduate Hospital on April 16, 1914. His parents were Russian Hebrews. The child was normal at birth, weighed 9 pounds and had always been well since, with the exception that he had measles at the age of one year.

His present illness began April 12, 1914, at which time he began to bleed from both ears and from the nose, but not from the gums, mouth or throat. A petechial rash appeared on the feet, legs, hands and arms. Later large ecchymoses appeared on the forehead, on the eyelids, and under the eyes, and then on the thighs and legs. There were small ecchymotic spots on the body also. When the lobe of the ear was pricked for a blood examination, there was persistent oozing from the point of puncture.

The laboratory report on the blood count showed: red cells, 4,300,000; hemoglobin, 68 per cent.; leukocytes, 16,200, with 74 per cent. polymorphonuclears; lymphocytes, 23 per cent.; transitionals 2 per cent., and eosinophiles 1 per cent. The blood culture was negative. The urine was normal. The ear discharge showed the bacillus pyocyaneus. The feces showed some blood microscopically. The temperature and pulse were only slightly elevated, but the child was restless, irritable and cried constantly. A diagnosis of Henoch's purpura was made.

The treatment consisted in the subcutaneous injection of 20 c.c. of the mother's blood at the time of admission. Blood transfusion was then suggested, and the seventeen-year-old brother agreed to act as the donor. The hemolysis and agglutinatin tests were negative. On April 18th, by the syringe cannula method of Lindeman, a transfusion of between 250 and 300 c.c. of blood was given. The bleeding tendency ended abruptly and up to the present time had shown no tendency to recur. The child was kept under observation in the hospital for twelve days and had since been seen. The discharge from the right ear had also been abated.

Case II. *Mild Secondary Anemia Following Injury.*—This patient was a male child, eighteen months of age, who gave a history of having had a supposed meningitis, double otitis media and bronchopneumonia. He had been breast-fed and then given a regular diet except for meat. On August 15th he fell down a flight of stone steps, striking on his left temporo-parietal region and producing a decided lump and contusion. He was not rendered unconscious and had no paralysis. Two days later he seemed drowsy, lost his appetite and occasionally vomited his food. For three weeks he lay in a semi-comatose condition, then gradually his mental condition cleared. While there was no paralysis, the child could not stand or sit without support. He was admitted to the Post-Graduate Hospital September 30, 1914, in a very relaxed and emaciated condition, his weight at this time being 16 pounds, 8 ounces.

Physical examination showed a double otitis media and moist râles over both lungs. His temperature was very irregular, ranging from 97° to 104° F.

The laboratory report showed a heavy trace of albumin in the urine, but no pyelitis. The Widal reaction was negative. The blood count showed. red cells, 3,600,000, hemoglobin, 54 per cent.; leukocytes, 38,000, with 78 per cent. polymorphonuclears and 22 per cent. lymphocytes.

At the request of Dr. Dennett the boy was transfused on October 22, 1914, the mother acting as the donor; the amount of blood given was 350 c.c. The improvement commenced with the operation and progress toward recovery has been uninterrupted.

After transfusion the blood count showed: red cells, 4,456,000; hemoglobin, 68 per cent.; and the leukocytes had dropped to 12,300.

Case III. *Henoch's Purpura.*—This patient was a girl, eleven years of age, who was admitted to the Post-Graduate Hospital on May 21, 1914. Her parents were Austrian Hebrews; her family history negative, except for measles and scarlet fever.

The patient's present illness began two months previous to her admission to the hospital with diarrhea and abdominal cramps. The abdominal pain increased in severity and was most marked on the right side, particularly in the right lower quadrant. Appendicitis or nephrolithiasis was suspected. A rash appeared on the legs, knees, hands and elbows. Blood was passed by rectum. The temperature was 102°F. and pulse 140. At this time any slight trauma would be followed by ecchymosis. A little later the child had three convulsions, evidently of uremic origin, as the urine showed blood; there was edema of the feet, legs, face, abdomen and back, which progressed until there was general anasarca. This edema had gradually disappeared until at the time of admission to the hospital it was not noticeable.

The patient was poorly nourished, sallow and looked chronically ill. The lips were thin and anemic, but otherwise physical examination revealed nothing abnormal, except that the post-cervical chain of glands, particularly on the left, were slightly enlarged. The muscular development was poor and there was a rachitic rosary present. The abdomen showed a tendency to "pot-belly," but there were no special points of tenderness. The liver was somewhat enlarged. The cecum was not markedly enlarged, but a slight succussion was obtained. There were purpuric spots on both knees and also large ecchymoses, about one and one-half inches in diameter, on the left external malleolus. The left epitrochlear gland was palpable and the inguinal glands palpable and slightly enlarged.

The laboratory report showed that the urine contained a moderate amount of albumin, red cells, and hyalin and granular casts. There was blood in the stools, both microscopically and chemically. The Wassermann reaction was negative. Blood examination showed: red blood cells, 3,168,000; hemoglobin, 35 per cent.; white cells, 18,900, with 77 per cent. polymorphonuclears and 23 per cent. lymphocytes.

The child was given a blood transfusion of 270 c.c., the father being the donor, and the preliminary blood tests having proved satisfactory. The transfusion was given on May 25th and the child looked and felt better immediately. She was discharged from the hospital on June 1st, at which time the blood count showed: red cells, 4,556,000; hemoglobin, 65 per cent.; leukocytes, 11,700, with 60 per cent. polymorphonuclears and 40 per cent. lymphocytes.

CASE IV. *Chronic Sepsis Following Pneumonia and Empyema.*—This patient was born October 23, 1912, and had been well until the present illness. He had had pneumonia in the latter part of July, and was brought to the hospital three weeks later, August 8, 1914, with an empyema on the right side. He was operated upon by Dr. Vincent. His weight at the time of the operation was 20 pounds, 12 ounces. He ran a very high temperature and gradually lost weight and strength. He refused nourishment and was forced to eat. This was followed by diarrhea, which further weakened the boy.

He was very sallow, yellow and septic looking; there was marked emaciation of the lower extremities and the patient was unable to sit or stand alone. There was moderate drainage from the empyema wound but no pocketing. The prognosis was considered hopeless, but as a last resort transfusion was suggested. It was not expected to accomplish anything. A transfusion of 235 c.c. of blood, the mother being the donor, was given. The temperature dropped immediately and has remained down since. The child's appetite was ravenous. The blood count before transfusion was: red blood cells 3,847,000 and hemoglobin 40 per cent.; today the red blood cells numbered 4,220,000 and hemoglobin was 77 per cent.

DR. ALFRED M. HESS said that in the treatment of the conditions under discussion by serum injections and blood transfusions, etc., he thought they should make a sharp distinction between immediate results and permanent ones. In cases in which there was a possibility of this treatment replacing blood, stopping hemorrhage or combating sepsis it should be used. It should be remembered that in purpura hemorrhagica attacks were sometimes very infrequent. In one case coming under his observation there was a recurrence of the condition after ten years; in other instances it recurred at longer or shorter intervals, so that whether transfusion was of permanent advantage in purpura hemorrhagica it remained to be seen. Dr. Hess said he had had one case of hemophilia in which this treatment did no good; the patient was just the same as ever and coagulation time of the blood was just as long. In another case of purpura hemorrhagica which had come to his attention transfusion had done no apparent good, and in still another case that Dr. Longcope had told of transfusion had been done three or four times within six weeks and the hemorrhage each time recurred, so that whether transfusion was of more than immediate advantage was problematical.

Dr. Hess said that another method which he had used was that of defibrinating the patient's own blood and reinjecting it. This stopped the hemorrhage. In one case this procedure had been carried out three times and it stopped the hemorrhage for a week or ten days after the serum was injected. This method had the advantage of being highly practical; no hemolytic tests were required, no difficult technique, no donor. These injections of autogenous blood should be tried in cases of purpura with hemorrhage.

Dr. William Shannon stated that he had seen a case of hemoptysis recently and Dr. Hess had also seen it. The child had been bleeding for a week and the family history showed that hemophilia was a family characteristic. He had seen this case five weeks ago for the first time; there seemed to be a combination of hemophilia and of a rheumatic purpura. This seemed to be a case in which transfusion might be of benefit.

TUBERCULOUS INFECTION OF THE CHILDREN OF NEW YORK TENEMENTS AS EVIDENCED BY THE APPLICATION OF THE CUTANEOUS TUBERCULIN REACTION

Dr. Maurice Fishberg read this paper. (See p. 20.)

Dr. Godfrey E. Pisek said he would like to ask Dr. Fishberg whether in the families ruled out as not having tuberculosis there were any boarders or lodgers. He also would like to know whether the converse of his statement was not the more important; whether if there was no reaction there was no possibility of the child's having tuberculosis (excluding terminal cases of course). If this were true the reaction would still be of distinct value.

Dr. Abraham Hymanson said that in an article on "Tuberculosis in Young Children," published in the Archives of Pediatrics in August, 1912, he had stated that during the years of 1909 and 1910 he had applied the Moro and von Pirquet test on 68 infants from two days to two weeks old, the mothers being apparently free from tuberculosis, and none of these children showed any trace of the disease. In another series of 18 cases he had applied both of these tests, not only in the infants, but in the mothers also. Four of the mothers showed positive reaction and 3 of these showed some physical signs of the disease and the sputum of 1 mother was positive. The infants invariably showed a negative reaction. He had looked for enlarged glands in 86 infants, but found none, with the exception of 1 infant, in which all the glands were enlarged. There was no history of syphilis in this case. Dr. O. Bondy applied the cutaneous tuberculin reaction in the newborn in 350 cases between the second and fourth days after delivery and found the test always negative, though he obtained a positive test in 71 of the mothers. Drs. Paten and Griemert applied the von Pirquet test in 53 children less than two weeks old, in 4 less than four weeks old, the others being apparently free from tuberculosis, and not one of the children showed a trace of reaction. Other observers had made similar tests, and the fact seemed to be established that almost all infants, with very few exceptions, were born free from tuberculosis, but that they contracted it during infancy or childhood, either from milk or through contact with infected persons.

Dr. Leon T. LeWald said he had made radiographic examination of the lungs of many children who had given a positive tuberculin reaction, and on no occasion had he found lung lesions, except in miliary tuberculosis; even when the children showed positive signs of the disease the lung was not infiltrated, but the process was located somewhere else in the body, in the bones, joints or lymph nodes, but not in the lungs. A tuberculous infiltration of the lungs was rare in children who reacted positively to the tuberculin test except in miliary tuberculosis.

Dr. Maurice Fishberg, in closing the discussion, said that Dr. Pisek's question was a very proper one; there might have been some boarders. The ubiquitousness of tuberculosis was much more extensive than was appreciated. In an investigation of an isolated mountainous district in Scandinavia with a population of 100, among whom there had not been a death from tuberculosis for ten or fifteen years. Overland found that about 75 per cent. of the population reacted positively to the tuberculin test. After investigation it was found that the village teacher was infected and was responsible for this high percentage of infections. Direct contact was not necessary in order to transmit the disease. This was evident from the fact that a cow that reacted positively to tuberculin placed with a herd, every one of which reacted negatively, resulted after a few months in a considerable number of positive reactions among that herd, though there might be no well-developed instance of tuberculosis. In regard to phthisiogenesis, recent research had shown very little about how tuberculosis was acquired. He did not know how it was acquired and others did not know. As to the negative reaction, a negative reaction often meant nothing whatever.

Where the reaction was positive and the disease was present it need not necessarily be in the lung, but might be in a joint, in glands, or other organs, since it was the organism that responded to the tuberculin.

EXPERIENCE WITH THE DIPHTHERIA TOXIN SKIN REACTION OF SCHICK

Dr. William H. Park said that in order to demonstrate the positive and negative Schick reactions he had brought with him two students who had submitted themselves to the test. The Schick reaction was due to the direct toxic action of the toxin of diphtheria; the negative reaction meant that the toxin was neutralized, while the positive reaction meant that the subject did not have sufficient antitoxin in the blood to neutralize the toxin introduced. There was also a pseudo reaction which was anaphylactic in type; in reality this was due to the endotoxins. It gave the impression of a much more decided reaction than the positive reaction, there being slight infiltration and hyperemia at the site of the injection.

Dr. Park then exhibited two guinea pigs. The one had been subjected to a double Schick test; that was, at one site an injection of the diphtheria toxin alone had been given, while at another site a similar dose of toxin, together with a dose of antitoxin sufficient to neutralize the toxin, had been given. At the site of the first injection there was an induration, while at the site of the second injection the toxin had been completely neutralized and there was no lesion. A second guinea pig had been inoculated with a non-virulent culture and showed the pseudo reaction, which was larger than the true reaction, and meant that the guinea pig was immune. The true reaction disappeared in the course of a week or more, while the pseudo reaction came quickly and went quickly, and had nothing to do with immunity. The anaphylaxis was due to the fact that some of the bodies of the bacteria had undergone autolysis in the broth culture and so some endotoxin was present with the true diphtheria toxin.

In applying the test the dosage employed was about 1/50 of the fatal dose, though the dose might be as low as 1/60 or as high as 1/30; with a larger dose there was danger of necrosis. If there was not an active antitoxin present and the reaction was doubtful the subject was put down as non-immune.

Dr. Park showed charts which demonstrated the result of the Schick test in children from the time of birth to the fifteenth year and in adults, when the toxin was administered in various ways—subcutaneously, intramuscularly and intravenously. In children between the ages of five and fifteen years 50 per cent. showed a positive reaction, so that about one-half of the children between these ages were immune to diphtheria and one-half were not. Among adults about 70 per cent. were immune and needed no immunization against diphtheria. In certain children "once immune always immune" seemed to hold good. In children who had had the disease the Schick test might be used to determine the limit of immunity.

At the Willard Parker Hospital they were not immunizing all the children admitted to the scarlet fever wards, but only those who showed a positive Schick reaction. Of 90 children showing a positive Schick reaction, after an immunizing dose of antitoxin 20 became really immune and 17 developed a large amount of antitoxin in the blood. A child that gave a negative Schick test was perfectly safe among diphtheria carriers and did not need the customary immunizing injection of antitoxin. Several other applications of this test could be made. One of these demonstrated the rapidity with which the antitoxin reached the skin when the toxic dose was administered six hours before the antitoxin by different methods—subcutaneously, intramuscularly and intravenously. When an intravenous injection of 1,000 units of antitoxin was given six hours before the toxin it suppressed the reaction; when given four hours before it greatly diminished the reaction, and when given two hours before it absolutely prevented a reaction.

There was another way in which the Schick test might be of some diagnostic value. If a case was supposed clinically to be diphtheria and one got a negative Schick reaction and a positive diphtheria culture one might conclude that the patient was a carrier and did not have true diphtheria; that patient might carry a virulent bacillus and yet have a non-virulent tonsillitis. About one-third of the cases of diphtheria developed antitoxin, while about two-thirds did not. When one member of a family was found to react negatively to the Schick test all the members of the family were apt to have a negative reaction.

Dr. Park said they were now making experiments looking to vaccination with dead bacilli in diphtheria as they were doing in typhoid fever. In using the Schick test the injections should be made intradermally and one should use a fresh dilution, not one that had been standing for any length of time, as such a solution would deteriorate and invalidate the results of the tests.

In response to a question as to how the diphtheria toxin was prepared, Dr. Park said that it was not prepared like the tuberculin, since with the tuberculin they wanted to keep the endotoxins, while with the diphtheria toxin they wished to get rid of the endotoxins. They had been using a six-day product, but were trying to get a forty-eight-hour one.

In reply to a question as to whether immunity to diphtheria was acquired, Dr. Park said that a very high percentage of adults reacted negatively to the Schick test and this was also true during early infancy, but during childhood the immunity dropped off and then the antitoxin began to be produced again as the child grew older; why this was no one knew. There was a large amount of antitoxin produced by some individuals, as much as 15 units had been observed, and why antitoxin should be thus produced beyond the apparent need was beyond comprehension. It might be that some saprophyte was making it.

TYPES OF PNEUMOCOCCI AND THEIR CHARACTERISTICS

Dr. Rufus I. Cole said that certain observations indicated that all cases of pneumonia apparently due to pneumococcus did not have an identical etiology. A study of the races of pneumococci isolated from cases of pneumonia revealed four types of organisms. It was found that a number of the races were similar. All of this group were agglutinated by the serum obtained by the immunization of animals to one of them, and such a serum also protected mice from infection with any one of the group. A second smaller series was also found to have common immunological characteristics, but these characters were entirely different from those of the first group. Finally a considerable number of races were found which had no common immunological features; each race appeared distinct. They had named those groups in which a considerable number of organisms were found to have common immunological characters Type I. and Type II. The pneumococcus mucosus (streptococcus mucosa of Schottmuller) they called Type III., and the group of organisms having no common immunological characters they had called Type IV., or, preferably, Group IV. A study had been made of the organisms obtained from 150 cases of pneumonia. Of this number, 57, or 38 per cent., belonged to Type I.; 44, or 30 per cent., to Type II.; 17, or 11 per cent., to Type III.; and 32, or 21 per cent., to Type IV., the heterogeneous group. Similar observations had been carried on by Walker in the Peter Bent Brigham Hospital in Boston and by Dr. Paul Lewis at the Pennsylvania Hospital in Philadelphia, in about 300 cases altogether. The results of their observations coincided very closely with those obtained at the Rockefeller Institute. It seemed that they might safely conclude that there was one type of severe infection due to pneumococci of Type III., in which the mortality was high; a second group of cases of lesser severity, due to organisms of Type II.; third, a group of cases only slightly less severe, due to pneumococci of Type I., and finally a large group of cases, due to the non-fixed type of organism, Type IV., in which the symptoms were milder and which usually ended in recovery. From the standpoint of prognosis alone, therefore, the determination of the type of infection in the individual cases was of considerable importance.

It might be of interest to speak of the toxic action of the pneumococcus, which they had been studying with the idea of getting a serum which would be efficacious in pneumonia. Up to the present time it had been impossible to bring any direct proof that the effects of pneumococcal growth in the body were due to the elaboration of a poisonous substance. Friedberger and Neufeld had shown that if the pneumococci were treated in a special way, with immune serum and complement, the solution so obtained was toxic for guinea pigs when it was injected directly into the veins. Since the symptoms produced and the kind of death resulting resembled the phenomena seen in acute anaphylaxis, the name, anaphylatoxin, was given to the substance so produced. On these observations was based the theory of the nature of infection by pneumococci and other nontoxin-producing bacteria according to which the bacteria did not produce any poison during their metabolic activities, but in the animal body by the action of certain substances in the serum the bodies of the bacteria were partly digested, and the digestion products of the proteins of the dead bacteria, or so-called split products, were poisonous. Later it was shown by Neufeld and Dold that to produce these poisonous substances the action of immune serum was not necessary, but that if washed bacteria were simply placed in salt solution at 37°C. for twelve to twenty-four hours, or longer, the bacteria underwent partial solution and when the solution thus obtained was injected intravenously into guinea pigs it produced the same toxic effects as anaphylatoxin. It was suggested that the digestion of the bacterial substance was due to the action of ferments contained within the bodies of the bacteria themselves. The process was then one of autolysis. The evidence, however, that the effects of such solutions were due to the products of digestion or split products had not seemed conclusive, and they had sought to learn whether or not similar results could be obtained from solutions of bacterial cells prepared under conditions in which digestion could be excluded. They had therefore made a series of experiments, first with the filtrates of cultures, which gave no specific effect; second, with solutions of bacterial cells, (*a*) in salt solution, (*b*) in cholate solutions, and (*c*) by freezing and grinding. They found that in all three instances the result was acute death of the guinea pigs and hemolysis of red blood corpuscles. Third, broth cultures of pneumococci were found to transform oxyhemoglobin into methemoglobin. Peabody had shown that during the terminal stages of fatal cases of pneumonia there occurred a progressive decrease in oxygen content and oxygen combining capacity of the blood. This was evidently due to the transformation of oxyhemoglobin into methemoglobin. Whatever might be the nature of the substance and of the reactions by which hemolysis and toxic effects in guinea pigs were brought about, one must bear in mind that the evidence was still very inconclusive that either one of these reactions was of significance so far as the intoxication in lobar pneumonia was concerned. On the other hand, there was considerable evidence to indicate that it was not through death and solution of the bacteria that the lesions and symptoms of pneumonia were produced, but that these were the results of changes caused by the life processes of the living, active bacterial cells. The injection of dead pneumococci, unless in extremely great numbers, had little effect on the experimental animal. Even when the animal was infected with large numbers of living pneumococci little or no effect was seen at once. It was not until the bacteria were actively multiplying that the effects became manifest.

Dr. Cole then outlined further studies on the transformation of oxyhemoglobin into methemoglobin, which led him to the conclusion that for the formation of methemoglobin by pneumococci the presence of living bacteria was necessary, and since the presence of minute amounts of nutritive material was also necessary it was probable that these bacteria must be actively carrying on nutritive functions, probably undergoing multiplication. Such substances must be present in the fluid immediately surrounding the bacteria. If the corpuscles and bacteria were separated by any limiting membrane, as by a dialyzing membrane or even a thin layer of oil, no reaction occurred. Other observations made it seem possible that the formation of methemoglobin depended upon some reactive substance given off by the bacteria, and this substance became inactive as soon as it diffused through the surrounding medium. The suggestion occurred that the reactive substance given off by the bacteria was in the nature of a ferment, being rapidly weakened or destroyed by diffusion. They had also studied the effect of oxygen in the transformation of oxyhemoglobin into methemoglobin. If oxygen was in excess, the preliminary reduction of the oxyhemoglobin was difficult and the reaction was delayed; if no free oxygen was present, the oxidation was impossible and no reaction occurred; if, however, the oxygen was first removed, and then after mixing the bacteria and hemoglobin free oxygen was added in excess, the reaction occurred more rapidly than when the oxygen had not been previously removed. From these observations it seemed not unlikely that the formation of methemoglobin occurred in the neighborhood of pneumococci because of a modification of oxidation and reduction processes in the medium immediately surrounding the bacterial cells. This change must be a specific one in the case of pneumococci; otherwise all living microörganisms would cause the reaction, which was not the case. The author then showed how this theory might be applied to actual conditions in pneumonia, provided one assumed a widespread distribution of the bacteria throughout the body.

In studying the action of pneumococcus immune serum, Dr. Cole stated that they had succeeded in immunizing sheep, but that when they had undertaken to transfer this immunity passively to guinea pigs the results were questionable, and they must believe that it was doubtful whether any neutralization of the toxic substance could be obtained in this way. The experimental studies did not indicate that an immune serum obtained by the injection of toxin possessed any high degree of antitoxic or protective power.

Their studies had shown why immune serum such as had been used in pneumonia would not be likely to show any beneficial result. In the first place, a pneumococcus immune serum was effective only against the type of organism used in the process of immunization. If, for instance, immunization was carried out with Type I., it might be expected that it would have no effect on any infection due to one of the other types of pneumococci. If the immunization was carried out with one of the organisms of Type IV. it could have no effect on any infection except that due to the same race. They had lately examined an antipneumococcus serum on the market which was said to be polyvalent, but experiments had shown that it had absolutely no protective power against organisms of Type I. or Type II., or, in fact, against any of the organisms against which they have tested it. Its use in treatment undoubtedly did more harm than good. In order to render an antipneumococcus serum theoretically useful in any type of pneumonia, it would be necessary, first, to produce a serum with high protective power against the type of organisms concerned; second, to have a satisfactory method of standardization of such serum, and, lastly, to have a method for quickly determining the type of organisms for each individual case. These conditions had now been satisfactorily met, as least so far as Types I. and II. were concerned. By the immunization of horses it had been possible to produce serums of high protective power against organisms of Types I. and II. As regarded Type III. it had been absolutely impossible to produce a serum having any protective power whatever. The use of immune serum in infections of this type was entirely without justification. Cases of infection due to this type were, however, relatively infrequent. Active immune serum might be produced to each of the organisms which had been placed in Group IV., but the serum in each case was effective in protection only against the individual race used for immunization. Therefore such a serum could not be employed with any hope of success. Fortunately, infections of this type were relatively mild. The cases belonging to Types I. and II. probably constituted the largest number of cases of this disease as seen in New York, and probably in this country. The speaker described a method by which it was possible to standardize immune serum fairly well. The last condition for the use of immune serum, namely, a method of rapidly determining the type of organisms with which one was dealing, had also been worked out. As soon as a patient with pneumonia was admitted to the hospital a portion of sputum coughed directly from the lung was obtained if possible, and, after washing, this was made into an emulsion in sterile salt solution or in bouillon, and this emulsion was injected into the peritoneal cavity of a mouse. Cultures were also made from the blood of the patient or, in case a satisfactory specimen of sputum could not be obtained, directly from the involved portion of the lung by the insertion of a sterile needle. The peritoneal cavity of the mouse was washed out four or five hours after the injection in order to obtain an emulsion. One then prepared an emulsion of the bacteria and its agglutinability was tested with an equal part of immune serum of Type I. and Type II. Agglutination usually occurred within a half hour. On theoretical grounds it was important that the serum be administered early, before the degree of infection was too great, certainly before there was a high degree of general infection. In treating a case of pneumonia, when the type of organism had been determined and found suitable for serum treatment, an intravenous injection of 80 to 90 c.c. of the appropriate immune serum was given. The dose was repeated in twelve hours and similar doses repeated on the following day; this was continued as long as it was indicated by the patient's condition. This treatment had been carried out thus far on only a small series of cases, too small to warrant the drawing of any conclusions, but the results had been extremely encouraging. In the treatment of pneumonia due to the organism of Type II. with immune serum the results had not been as satisfactory as in the cases due to Type I.

Dr. William H. Park said there were two questions which he would like to ask Dr. Cole. They were frequently called up on the telephone and asked in regard to the advisability of administering pneumococcus sera and they had been telling the inquirers not to use them. Would using Type I. serum not be of some help? Might it not do good in about one-half of the cases? Of course it could do no good in cases of Type III. If one did not know with which type of pneumococcus bacilli he was dealing what was the best course to pursue in regard to the vaccines?

As to prognosis, after one had seen a case of pneumonia and learned twenty-four hours later to which type it belonged, should he be guided in his prognosis by the group to which the case belonged, or by the clinical appearance of the patient? If, for instance, the patient had a light attack and one found that he had bacilli belonging to Type III., would you give a serious prognosis based on the laboratory findings?

Dr. Cole said that if one was sure that he was dealing with a certain type of pneumococcus bacilli the thing to do was to administer the serum immunized to that type, but to be effective they had found that with animals they had to give very large doses. One might do harm with such large amounts of sera and their administration would hardly be practical. It was scarcely worth while to try a serum unless one knew with which type he was dealing and felt confident of doing some good until they had had further experience with the different types.

The determination of the type was of great value in prognosis. Just yesterday Dr. Cole said he had seen a man sixty-five years of age who seemed to be in a very serious condition, but the organism was found to belong to Group IV. and he felt more cheerful about him. He felt sure that this differentiation of types was of material aid in prognosis.

In reply to the question as to how they determined the various groups, he had explained that they differentiated all pneumococci by the agglutination and protection tests. No given type was acted upon by any organisms of a different type. They made the protection tests by the simple method of injecting animals.

In reply to the question whether a mixture of the sera of two groups had been found practical, Dr. Cole said they had used an immunized horse and titered to that type. Type II. still showed a very low titer. The serum obtained for Type IV. last winter and the year before were of different power and hence the results with this type had not been constant. If one could determine the type of bacilli it was better to use that type alone.

DR. HENRY HEIMAN asked Dr. Cole if he considered lobar pneumonia an extension of a hematogenous affection?

DR. COLE replied that he felt from experience that lobar pneumonia was a direct infection of the lung and not a hematogenous affection. They were making investigations with animals that led him to think that perhaps something more than contact played a part in the infection; there seemed to be an autogenous factor.

DR. PARK said that Group IV. was not a group in the proper sense of the world; this group might embrace a large number of varieties and there might be some semi-saphrophytic ones. This was an important question with him, as it had some relation to the present discussion in regard to the subway overcrowding.

DR. ROPER asked if one type of pneumococci had ever been observed to be transformed to another type.

DR. HYMANSON asked if any deterioration in the serum had been noted with time.

DR. COLE said that he could not say whether there was any deterioration with time, as they had not kept any serum long enough to be sure. Six months was the longest that they had kept it; in that time it had shown no deterioration, but it might do so later.

As to the possibility of the transformation of one type of pneumococci into another, they had never seen such a transformation. Type I. had been passed through 125 animals and remained Type I. always. They had examined the types through the various stages of the disease and during convalescence and agglutination tests always showed the same organism. What Dr. Park had said of Group IV. was true; there might be 150 varieties, but each was an individual type and absolutely distinct. They seemed to have found two varieties of the organism in South Africa which had not been found here, but these also were absolutely distinct.

Dr. Frank S. Fielder asked if a patient might be infected with more than one group of organisms at the same time.

Dr. Cole said he had never found Type I. and Type II. at the same time in the same patient. If Type I. and Type IV. were both present, Type I. came out and Type IV. did not. Type I. was more virulent and suppressed Type IV. One never got an "even up" mixture.

Dr. Charles Gilmore Kerley asked why the mortality from pneumonia was lower in children than in adults.

Dr. Cole replied that he had made no observations along that line and had no theories to offer.

Intestinal Infection in Infants.—H. Schelbe (Jahrb. f. Kinderhk., 79, Bd. XXIX., H. 5, 1914) says that we no longer speak of acute epidemics of intestinal infection, because we have learned to feed children better. Chronic infections are often referred at present to the bacillus coli. Others regard them as parenteral infections, due to catarrh of the respiratory organs. The author gives an example of how careful we should be in our diagnosis of the etiology of such affections. In one house 16 children sickened within two days, only 4 in the house remaining well. All had anorexia, fever, and malaise. Seven of them lost considerable weight. None died, and almost all were improved in three days, after proper feeding. When we come to consider the cause of the epidemic we find that all took the same milk, and the children who remained well took no milk at all. Parenteral affections can be ruled out, because all the children began to be sick at once and there were no cases of grippe or catarrh of the respiratory tract among them. Therefore, the source of infection must be sought in the food alone. In examining the stools no typhoid, paratyphoid or dysenteric germs were found.—*American Journal of Obstetrics.*

THE PHILADELPHIA PEDIATRIC SOCIETY

December 8, 1914

W. N. Bradley, M.D., President

PROGRESSIVE MUSCULAR ATROPHY

Dr. R. L. Engle showed a girl of thirteen years with progressive muscular atrophy of the Aran-Duchenne type. Illness began seven years ago, following whooping-cough. Over a period of six months there developed stiffness in the left leg, lameness and indefinite pain. The finer movements of the hands became awkward and clumsy. Three years later contractures of the hands and right foot were first observed. The condition has not progressed since, but for the past year she has complained of general weakness and poor appetite. There have been no other symptoms. She shows marked emaciation; exaggerated supra and infraclavicular fossæ; active abdominal reflexes; diminished deep reflexes of upper extremities; active knee-jerks; diminished right Achilles reflex. All cranial nerves are intact; no sensory disturbances. On both hands there is marked atrophy of the smaller muscles; of the flexors and extensors of the forearm, arm and shoulder. There is similar atrophy of the leg and foot muscles, but those of the thigh are best preserved. Muscular twitchings are only visible after irritation. There is marked weakness of the muscles of the extremities, the patient, to rise from the floor, turning over on hands and knees, and climbing up on herself. Electrical examination shows partial reactions of degeneration.

Newer Views on the Subject of Tonsils and Adenoids

THE RELATIONS OF THE TONSILS TO TUBERCULOSIS

Dr. H. R. M. Landis said that, in dealing with children, it is important to remember that we have to do with an age period in which all lymphoid tissue is in excess, as judged by adult standards. This is true of all lymph nodes throughout the body. Failure to recognize this fact has led some observers to base a diagnosis of tuberculosis on palpable cervical lymph nodes alone. Had they examined other groups of superficial lymph nodes the same enlargement would have been noted. Dr. Landis found superficial lymph nodes readily palpable in all children between two and twelve years, irrespective of social conditions. By adolescence lymph nodes are only palpable as the result of local or general disease. The tonsils are subject to the same evolution. Simple hypertrophy of the tonsil is no good reason for its removal.

In regard to the relationship between tonsils and tuberculosis, we have three factors to consider: (1) The rôle played by the tonsil as a portal of entry; (2) primary tuberculosis of the tonsil; and (3) secondary tuberculosis of the tonsil.

(1) To establish the first fact is far from easy. While occasionally tubercle bacilli pass through the tonsils and set up tuberculosis of the cervical lymph nodes, tuberculosis of the nodes is not always produced in this way. Inflammatory swelling of the cervical nodes may arise from eczema, carious teeth, and other processes of other structures within the buccal and pharyngeal cavities. Thus the source of infection of the cervical lymph nodes is multiple and not single. Besides, tuberculosis is manifest in a severe form and at an earlier age in the bronchial lymph nodes than in the cervical. Granting that the tonsil may afford an easy means of entrance for the tubercle bacillus, its removal does not entirely free the child from danger, inasmuch as there still remains much lymphoid tissue which is drained by the cervical lymphatic system. Many tonsillotomies are partial, and the portion left may still be vulnerable for the tubercle bacillus, just as it is for organisms producing acute inflammation.

(2) As the result of microscopic examination of tonsils, primary tuberculosis is said to occur in about 5 per cent. of cases in which the tonsil is hypertrophied. In the majority of instances this is an accidental finding. Primary localization in the tonsil is not common, as borne out by inoculation experiments, which prove that tubercle bacilli may pass through the tonsil without causing damage and infect the lymph nodes.

(3) By far the commonest form of tuberculosis of the tonsil occurs secondarily to advanced pulmonary and laryngeal lesions. It may manifest itself as extensive ulceration of the tonsil itself with extension to the pillars, uvula and adjoining parts. In most advanced cases the tonsils show no visible change, but if examined microscopically the great majority show tuberculous changes. In these cases the tonsils are subjected to an overwhelming infection and the resistance of the individuals has been tremendously reduced.

The question how the tubercle bacillus gains access to the lungs remains shrouded in mystery. The tendency is now again toward the inhalation theory. Dr. Landis admits that the tonsils may be one of the portals of entry, but is not willing to grant that they play this rôle except in a very small percentage of cases. Nor does he believe that removal of the tonsils in children with a tuberculous parentage or children in the so-called pretuberculous stage is indicated, unless the tonsil is obviously and unmistakably diseased.

INFECTION THROUGH THE TONSILS

Dr. G. B. Wood, by invitation, read this paper. He said that the question of tonsillar infection is yet in such an unsettled state that in a large number of cases the operation of removal of the faucial and pharyngeal tonsils is done with the hope that the patient will be benefited, but without absolute knowledge that the tonsils are the cause of the general infection. Because of the impossibility to determine absolutely whether the tonsil is at fault, a cry of horror has been raised at the "massacre of the tonsils." They have accumulated sufficient experimental and clinical data to make a plausible appeal for their contentions. Henke, a recent defender of the tonsils, published in the Archiv. f. Laryng. u. Rhinol. this year his results of a series of cases. He injected pigment into the nasal mucosa and gums of animals and human beings and found a certain amount of it in their tonsils. He deduces from this that the tonsillar tissues of the throat have the function of eliminating toxins from the general lymphatic system. In a later number of the Archiv. appeared a paper by Amersbach, who carried out a similar series of experiments, but with more careful attention to his technic. His results were absolutely opposed to those of Henke and controvert the theory that the tonsils are organs of elimination. This accords with our previous knowledge. The facts which lead us to believe that the tonsils are at times a source of cryptogenic infection are: (1) The anatomy of the epithelium is such that we have a lessened barrier, as far as mechanical defence is concerned. From the beginning there is a peculiar disintegration of the basal cells of the cryptal epithelium, causing distinct lessening in its continuity and the absence of a basement membrane and subepithelial layer of connective tissue. (2) The clinical study of a large number of cases of tonsillitis and its relation to general infection has demonstrated that certain organisms attack first the tonsils and may later be found in the blood and other organs; also that in some chronic cases of general toxemia the condition clears up rapidly after the removal of the tonsils. (3) The pathologic study of acute tonsillitis shows that the attack is first against the epithelium of the crypts. The ordinary pyogenic organisms gain entrance to the parenchyma of the tonsil, producing typical symptoms of acute suppurative tonsillitis only after the feeble barrier of the cryptal epithelium has been destroyed. (4) It has been shown experimentally that in the tonsils of the hog the tubercle bacilli will pass unaltered through the epithelium of the crypts and enter the interfollicular tissues and be taken up by the efferent lymphatics and carried to the regionary lymph nodes before damage to the tonsillar tissues has taken place. Further, that while infection of the tonsillar tissues of the hog is extremely easy a simultaneous infection of other portions of the mucosa of the mouth and pharynx practically never happens. Dr. Wood believes that we are justified in drawing the conclusion that the tonsillar structure of the throat is more easily penetrated by bacteria than are other portions of the mucous membrane of the upper respiratory tract.

THE INDICATIONS FOR THE REMOVAL OF TONSILS AND ADENOIDS

Dr. F. R. Packard pointed out that the indications for removal of the tonsils differ from the indications for removal of adenoid growths in the nasopharynx. He details the different indications for each, pointing out that Meyer's original article describing nasopharyngeal adenoid growths practically covered all the indications for their removal. In regard to the indications for removing tonsils, formerly hypertrophy was regarded as the sole indication, but at present their rôle as portals of infection has led to more operations being indicated on that account than for any other single indication. He refers briefly to the infections which follow disease of the faucial tonsils. There are practically no contraindications to removal of the tonsils, aside from the dangers attached to the operative procedure employed.

THE RELATION OF THE LYMPHOID TISSUE OF THE UPPER AIR PASSAGES TO THE VOICE

Dr. G. H. Makuen, by invitation, read this paper. While the lymphoid tissue of the upper respiratory tract resembles that found elsewhere, there are marked structural differences in the distinctive portions of the tissue itself. It is always present in close approximation to some of the most important vocal organs. This tissue varies during the life of the individual, and physiological conditions are often mistaken for pathological and treated accordingly. Voice, a vehicle for expressing thought and feeling, is essential to psychological as well as physiological development. The lymphoid tissue of the upper respiratory tract may affect the voice in three ways—through its action as a lubricant to the pharynx, through its influence upon the action of the muscles employed in phonation, and through its effect upon the resonance chambers of the voice. Normal lymphoid tissue lubricates the pharynx, while abnormal lymphoid tissue either fails to lubricate or lubricates it too much. The muscles chiefly influenced are the palatopharyngei, palatoglossi and superior constrictor muscles and all the resonance chambers of the voice are affected by it. Large adenoids and tonsils interfere with the development of the facial bones and the alveolar arches, and by their effect on respiration and phonation also interfere with the development of the phayngeal, laryngeal and thoracic cavities, materially altering the size, shape and contents of all the resonance chambers of the voice. Degenerated tonsils injure the voice by causing congestion and hypertrophy of adjacent membranes and muscles, interfering with normal action. Lymphoid tissue prejudicial to the voice is also prejudicial to the general health of the individual and there is a dual reason, therefore, for trying to restore it to normal. From the vocalist's standpoint, operative measures are always a misfortune, because a tonsil requiring operation is always hypertrophied or degenerated, either condition being deleterious to the voice; and it is doubtful whether after any operation the tonsils are ever normal. While the chief reason for operating is to conserve the individual's general health, it is no less important to conserve or improve the patient's voice. Every child should be regarded as a possible singer, and the conservation and development of its vocal organs must always be carefully considered. In childhood the voice is easily injured, as the vocal organs are growing and developing. Congestion of the pharynx or acute tonsillitis is not enough reason to remove the tonsil; for the cause may be in some remote part of the body. The less radical the operation, the less liability will there be of injury to the voice. Hence the desirability of conservatism. Normal lymphoid tissue is beneficial to the voice, but abnormal lymphoid tissue harms the voice. Operative measures which are beneficial to the general health may be decidedly injurious to the voice. An extracapsular tonsillectomized pharynx is always a damaged pharynx and the operation should only be done when the damage to the pharynx and to the individual threatens to become greater by leaving it undone.

Dr. J. Solis Cohen said that the papers had greatly interested him. He spoke of children with cleft palate with good voice production, which was due to occlusion of the rhinopharynx by enlarged tonsils, and called attention to the importance of not removing such tonsils, the effect of which would be to redevelop the imperfect phonation common to cleft palate.

Dr. Percival Nicholson asked what could be done to repair damage to the pharyngeal muscles by operation; also what was the result of removing the uvula.

Dr. H. A. Hare thought that the tonsils had been blamed too much for conditions occurring in remote parts of the body. Tuberculosis of the glands of the neck certainly does not enter through the tonsils. Dr. Hare asked just what type of tonsils required removal. He has decided when asked about the removal of a child's tonsils, that if only one was enlarged and not infected, operation was not necessary. Also when the tonsils, although enlarged, have no filled follicles, he has decided against operation unless they are obstructive. But in tonsils with follicles filled up with infectious material he advises removal just as soon as acute symptoms have subsided. Enuresis is surely not due to hypertrophy of the tonsils. He thinks the tonsils have a protective function, therefore the child may need them. Enlarged tonsils should be removed only in selected cases. Very young children whose tonsils, though enlarged, have not been removed by operation, often seem to overcome the enlargement as they grow older. Much depends upon the development of the cranial skeleton. If the development is pinched and the spaces narrow, the tonsils if enlarged must come out. If the parts are spacious they can remain.

Dr. J. P. Crozer Griffith said that his position was that of many members of the Society, who saw conditions in which they had to determine the relationship between the condition and hypertrophied tonsils. The question of the necessity or advisability of removing such tissue was constantly arising, the ultimate decision being left by the family to the child's physician, even after the rhinologist had stated his opinion. We should have good reasons for or against operation. It is a well-known fact that children have a natural tendency to enlarged lymph nodes all over the body. Hypertrophied tonsils or adenoids are not necessarily the cause of slight enlargement of the cervical lymph nodes; nor is operation necessary. Tubercle bacilli may undoubtedly gain entrance through the tonsils, but it is generally known that cervical adenitis in infancy is most frequently not tuberculous. Tuberculosis in infancy has involvement of the tracheobronchial glands, and it is reasonable to believe that those glands are first involved which drain directly the mucous membrane nearest them. Therefore these germs enter through the mucous membrane of the lungs. Dr. Griffith asserted his belief that removal of tonsils and adenoids was frequently very important. Certain factors are important in forming the decision for or against operation. It is imperative to determine whether the adenoids or hypertrophied tonsils are actually doing or are likely to do damage soon. The mere presence of both, associated with moderate enlargement of the cervical lymph nodes, is not enough to warrant operation. But persistent mouth-breathing with adenoid face and impending or developing deformities certainly requires relief. Deafness with adenoids necessitates their removal if of frequent occurrence or tending to be prolonged. Unusually frequent tonsillitis also warrants removal of the tonsils. But it must not be forgotten that children readily acquire tonsillitis and may outgrow this tendency as they grow older. Dr. Griffith thought that we should not assign too readily the causative influence to adenoid and tonsillar hypertrophy. The decision in favor of an operation often causes anxiety to the parents, to say nothing of the fright and discomfort of the child. And to many people, much above the hospital class, the cost of the operation, with attendant expenses, is a serious item. We must, therefore, be sure that any operation is needed before advising it.

Dr. J. C. Gittings said that Dr. Packard's historical sketch must possess some significance. A possible explanation suggests itself: that the incomplete and poorly performed tonsillotomy of the early years was not productive of good results. Dr. Gittings considers the complete operation by far the most effective. He does not regard this complete operation in any sense a "simple surgical procedure." The possibility of infections, and especially the risk of serious or fatal hemorrhage or shock, to say nothing of the mental anguish mentioned by Dr. Griffith, has caused Dr. Gittings to become distinctly conservative, and he advises operation only when the laryngologist is convinced that the tonsils are undeniably and hopelessly diseased or that very definite benefit will result from their removal.

Dr. J. H. McKee said that the pediatrician tends to judge adenoids and faucial tonsils from the standpoint of infectivity rather than that of size. Otitis and chronic deafness are the principal dangers of adenoids. In hypertrophied tonsils the principal dangers are infection of the tonsillar lymph nodes, other infectious diseases, which may be more serious on account of the presence of adenoids or enlarged tonsils, and rheumatic diseases, with the tonsils as port of entry. These factors guide us rather than the size or appearance of the tonsils.

Dr. Landis added that he had recently examined over 300 children, one or both of whose parents had tuberculosis, and over 40 per cent., though apparently well, showed enlarged tonsils. The tonsils were studied in about 200 of these children and not over 5 per cent. demanded operation. Nevertheless, tonsils which are manifestly diseased and greatly enlarged should be removed. Other tonsils should be left unoperated but kept under observation.

Dr. Wood called attention to the fact that Dr. McKenzie concluded that the tonsillar tissues ought to be operated on when necessary. The question is, "When is it necessary?" Inspection only affords little data to indicate their relation to systemic infection. It is necessary to take into consideration the amount of enlargement of the cervical lymph nodes in comparison with the lymph nodes in other portions of the body; the exact position of the enlarged nodes; the general health of the individual, and the possibility of other sources of cryptogenic infection. The specialist must work with the general practitioner. The size of the tonsils has comparatively little to do with systemic infection. Probably the most injurious type of tonsil lies considerably embedded, almost hidden, between the faucial pillars, usually escaping the eye of the general practitioner. When the tonsils are at fault the results following complete enucleation are sometimes marvellous. Dr. Wood added that there was no evidence at present to show that the tonsils are in any way protective to the human organism.

Dr. Packard said that fewer tonsils are now being removed. The laryngologist should only remove them when there are good grounds for supposing them to be the cause of some pathological condition. This can only be told by examination of the individual case. Sometimes very large tonsils are a source of but little trouble and merely ocular inspection of the throat is not sufficient upon which to base judgment in regard to their removal.

Dr. Makuen said that there were two questions—Is an operation necessary and what kind of an operation is indicated? Dr. Thomas R. French, of Brooklyn, had recently devised a method of making a differential diagnosis for the purpose of ascertaining immediately prior to operation just what particular operative procedure should be adopted. If the tonsil is found actually diseased, he advises complete tonsillectomy, but if it is only hypertrophied he thinks a less radical operation sufficient. Dr. Henry L. Swain, of New Haven, thinks that bacilli may be caught in the tonsil as in a net and held there until destroyed by phagocytic action. In substantiation of the belief that the tonsils have some protective function, he called attention to the fact that when they are enucleated other portions of the lymphoid ring tend to increase in size, as if to take the place of the tissue that has been removed. He thought that nothing could be done to repair damages to the palate by operation, except to teach the patient how to make the best of a most unfortunate condition.

ERRATA

In the December, 1914, number of the Archives, page 951, the name of the publishers of Dr. Zinsser's book, "Infection and Resistance," was omitted. Messrs. Macmillan & Co., New York and London, are the publishers. Will they please accept the Archives' apologies?

DEPARTMENT OF ABSTRACTS

ORIGINAL CONDENSATIONS OF CURRENT PEDIATRIC LITERATURE BY THE EDITORS AND THE FOLLOWING ASSOCIATES

T. Wood Clarke,.........Utica, N. Y.
Coleman W. Cutler.....New York City
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Edwin T. Wyman.......Boston, Mass.
J. Herbert Young.......Newton, Mass.

JOHNS, FOSTER M.: EOSINOPHILIA IN ANAPHYLACTIC REACTIONS. (New Orleans Medical and Surgical Journal, November, 1914, p. 543.)

Many anaphylactic reactions are accompanied by increase of eosinophiles. Johns explains the cause of at least 3 cases of unexplained eosinophilia with a train of anaphylactic symptoms. He states that a reaction produced artificially never shows eosinophiles, while the contrary is the case in those produced by animal proteins. This occurs in the higher parasitic animal diseases in proportion to the amount of animal proteid liberated in the body; thus in trichinosis the eosinophilia is highest—70 to 80 per cent.—at the time of death of the greatest number of organisms in the tissues. The eosinophilic scale decreases in parasitic diseases as the amount of proteid containing substances which they inject into the body decreases, *i.e.*, incinaria and bothriocephalus. He explains the eosinophilia of emphysema and enterogenous cyanosis as bearing the almost definitely decided cause of absorbed intestinal animal protein. He notes the fact that in the anaphylactic urticarias of certain individuals only those show eosinophiles which have as a cause the ingestion of vegetable proteids. Severe coryzas with violent sneezing are sometimes anaphylactic. Five cases showed eosinophilia before and during attacks, 2 cases were entirely free from symptoms and eosinophiles disappeared during a period of diet which forbade animal protein. In conclusion, he remarks that the eosinophilia is induced in many cases as a response to the introduction in sensitized animals of the higher animal proteins.

S. McL.

Lewy, Alfred: Report and Comments on 26 Cases of Tonsillectomy Two and One-Half Years after Operation. (Annals of Otology, Rhinology and Laryngology, September, 1914, p. 592.)

The conditions investigated were remains of adenoid or tonsillar tissue, deformities, present condition of upper respiratory tract, growth and nutrition as compared with other members of a family, general health, tendency to local or systemic infections, cervical adenitis, goiter and condition of ears.

Nine patients were improved or cured of the condition for which the operation was performed; especially is this true of those that had suppurating ears. Seventeen were apparently not benefited, 3 of them being troubled with laryngitis and 1 with sinusitis. Of the 5 patients under six at the time of operation, 3 are undersized and the others in this group still have some postnasal discharge.

"Frequent sore throats and ear trouble" have been benefited and only 1 of the 26 has had ~~a~~ contagious disease since the operation, but this fact may be due to the less common occurrence of these diseases in older children. The author is of the opinion that the results did not justify the operation in 17 of these cases, and he believes that in children before the age of second dentition tonsillotomy should be done rather than tonsillectomy. As these children were those living under improper hygienic conditions, and out of 400 requests sent out but 26 responded for examinations, this rather pessimistic report may not be taken as a criterion for results to be expected under other conditions, such as private practice. S. W. T.

Frazer, Thompson: The Significance of the von Pirquet Test. (Medical Record, January 9, 1915, p. 57.)

Von Pirquet found that the reaction occurred in but a small proportion of infants, but that with advancing years it became more and more frequent, so that at the age of ten about 70 per cent. of the children tested gave a positive reaction. Almost no adults gave a negative reaction. The large percentage of these children were without clinical signs of tuberculosis, pointing therefore to a previous infection with tubercle bacilli. von Pirquet believed that a positive reaction was of the greatest diagnostic importance during the first two years, and reactions occurring after two years were presumptive of latent tuberculosis. The author, in his series of cases and by reviewing the more recent literature on the subject, forms the following conclusions, somewhat at variance with von Pirquet's original findings:—

(1) A positive cutaneous reaction is less frequent in children than it was once thought to be, the high percentage of reactions obtained being due to the application of the test chiefly to infected children of the poorer classes.

(2) A positive reaction is of greater significance than it is commonly supposed to be.

(3) While there is an increasing percentage of reactions with years, and a corresponding decrease in the value of the reaction, the view usually held that the reaction has significance only during the first two or three years of life is not borne out by recent figures, and that we should be suspicious of a reaction occurring up to the age of ten.

(4) Annual tests should be instituted in the effort to detect early infection, and proper means should be taken to prevent the development of old foci into disease.

(5) A negative reaction, repeated, is valuable evidence of the absence of tuberculosis unless the child be suffering with advanced or acute disease, especially measles.

(6) Further study of the test is necessary before the reaction can be fully interpreted and refinements of technique are necessary to determine with greater accuracy the recency of the infection.

H. R. M.

HESS, M. D.: ALFRED F.: THE USE OF A SERIES OF VACCINES IN THE PROPHYLAXIS AND TREATMENT OF AN EPIDEMIC OF PERTUSSIS. (Journal of American Medical Association, September 19, 1914, pp. 1,007-1,010.)

Experiments were made with vaccines in the prophylaxis and active treatment of pertussis during a recent epidemic at the Hebrew Infant Asylum, New York. Four different vaccines were used, each prepared from one or more strains of the Bordet-Gengou bacillus. In most of the cases three inoculations of 100, 200 and 400 million bacteria were made at three-day intervals. Two hundred and forty-four children who were exposed to the disease were inoculated. Of this number 20 subsequently developed pertussis. The best results in this group were obtained from the use of a vaccine prepared from four typical cultures of the Bordet-Gengou bacillus. One hundred and thirty children did not receive prophylactic inoculations. This group included a ward of 25 infants under one year old, and another ward of 30 infants between twelve and eighteen months. Only 1 case of pertussis developed among the 25 cases of infants under one year old. No case developed among the other 30 infants. Eliminating, therefore, these 55 cases, where exposure practically did not exist, we have 80 children who were not vaccinated. Of these 80, 59 developed pertussis (Cf. 20 in 244 cases.)

In the active treatment, 65 cases of pertussis received vaccine injections, and 20 did not. The same vaccines were used as in the prophylactic cases. No other form of treatment was given to either group of patients. The results were not as promising as in the preventive treatment; neither the severity nor the duration of the disease was diminished.

In no case did any harmful results or systematic reaction follow the injection of the vaccine. The vaccine did not prove to be of any use for diagnostic purposes.

M. F.

Briggs, H. H.: Tuberculosis of the Middle Ear. (Annals of Otology, Rhinology and Laryngology, September, 1914, p. 529.)

It is stated that about 25 per cent. of cases suffering from tuberculosis in any part of the body have a tuberculous middle-ear infection, and in school children there are probably more than 2 per cent. that have middle-ear tuberculosis. Cases are not generally seen in these children until a mixed infection has complicated what was at first a tuberculous lesion. The mode of entry in children is much more common by way of the digestive tract than by any other route. Among the predisposing causes are existence of tuberculous lesions in other parts of the body, especially in the glandular and osseous systems; primary involvement of the mastoid with secondary middle-ear infection is not uncommon; abnormal conditions of the upper respiratory tract are responsible for ear infections—adenoids and nasal obstructions that interfere with drainage are the most common of these; infancy and childhood offer a predisposition because of the anatomic relations of the eustachian tube, the prevalence of the exanthemata, the frequency of inflammations of the pharyngeal lymphatics and the weaker resistance of the child as compared with the adult.

In making a diagnosis of a tuberculous otitis, one must first look for the general symptoms, such as fever, loss of weight, conditions of the lungs, joints and bones. There is not apt to be localized pain; facial paralysis is much more common in this type of otitis than in any other; there is usually marked impairment of hearing and the discharge is foul and often bloody; granulations are common about the tympanic perforation, and it is in these granulations that the tubercle bacilli are most often found. The diagnosis may be established by the tuberculin test and by the experimental inoculation of animals. The prognosis is unfavorable and the writer urges the more general use of tuberculin in properly selected cases. There is a report of 5 cases, two of them being in children. S. W. T.

MABBOTT, J. MILTON: INFANT FEEDING WITH TOP-MILK. (Medical Record, December 19, 1914, p. 1,043.)

The author uses the top 5 ounces of milk from the ordinary quart bottle as delivered in New York City. This approximates from 12 to 16 per cent. of fat, practically the same as gravity cream of the same percentage. He starts at the age of one week with 5 ounces of this top-milk and 10 ounces of water and increases the amount of food once a week by adding an extra ounce of top milk and an extra ounce of water to the daily quantity. At the sixth week he reaches 10 ounces and 15 ounces respectively. This amount of water includes the lime water used, if any. After the seventh week the quantity of water remains stationary. The quantity and strength of the food is increased by going deeper into the bottle each week for an extra ounce of milk. At three months the quantity of top milk remains stationary; and hereafter, until the baby reaches the age of twenty weeks, the food allowance is increased weekly by adding 1 ounce of whole milk to the quantity used. Beyond six months the quantity of food remains the same, the whole milk being increased and the water reduced in equal amounts. Thus at seven and a half months the food will consist of one pint of top milk, a pint and a half of whole milk and a half pint of water. Eventually the top milk is replaced by whole milk. The author considers the baby's size, weight and digestion as well as its age, and feeds each case as an individual and not by his chart alone. H. R. M.

THEISEN, CLEMENT F.: AN UNUSUAL INFECTION OF THE EPIGLOTTIS AND LARYNX IN A CHILD—TRACHEOTOMY—RECOVERY. (Annals of Otology, Rhinology and Laryngology, September, 1914, p. 569.)

A twelve-year-old boy, having had measles a month before being seen by the writer, was brought to him for a slight sore throat. There was then a slight faucial redness, tonsils not inflamed, but the boy could not lie flat on account of obstruction to breathing. This obstruction was seen to be a very much swollen and edematous epiglottis. Several incisions were made in this swollen organ, a culture was taken and ice internally by spray and externally by coil was ordered. The temperature was 103°. In two hours the breathing was worse and an hour later a tracheotomy was done, which relieved the boy at once, but it was a week before his temperature became normal and there was considerable swelling of the cervical glands. The cultures showed only staphylococci and streptococci.

The author believes that these acute infections of the lower throat, associated with edema, are distinct pathological conditions belonging to a class by themselves and the origin of infection is somewhere in the pharyngeal lymphatic tissue. S. W. T.

TALBOT, FRITZ B., M.D., AND HILL, LEWIS W., M.D.: THE INFLUENCE OF LACTOSE ON THE METABOLISM OF AN INFANT. (American Journal of Diseases of Children, September, 1914, pp. 218-227.)

Various percentages of lactose were fed to an infant without very marked corresponding changes in the fat and proteid percentages. The quantitative nitrogen, fat and sugar of the milk, feces and urine, as well as the ash and the acidity of the stools, were determined by appropriate chemical analyses. Clinically, the results were noted by the general condition of the child, number and character of stools, and gain or loss in weight. When the sugar content was about 7 per cent., absorption of fat, nitrogen and ash was high, nitrogen and ash retention increased, the stools were few in number, well formed, contained a relatively small percentage of fat and fatty acids, and there was a steady rise in weight. Increasing the sugar above 7 per cent. resulted in markedly lowered absorption of fat, nitrogen and ash, lowered retention of nitrogen and ash, diarrhea, green, watery and acid stools of high acidity, with a large residue of fats and fatty acids; excoriation of the buttocks and loss in weight. The amount of sugar which an infant can digest varies with the individual.

M. F.

PALMER, WALTER W.: THE ABSORPTION OF PROTEIN AND FAT AFTER THE RESECTION OF ONE-HALF OF THE SMALL INTESTINE. (The American Journal of Medical Sciences, December, 1914, p. 856.)

This is the report of the author's case, a housewife, forty years old, who was operated upon for chronic obstruction of the small intestine. At operation many tuberculous ulcers and strictures in the lower third of the small intestine were found and a jejunocolostomy was made. The following data was reported as follows: (1) The loss of nitrogen in the stools is four to five times that of normal individuals. (2) The loss in fat in the stools is five to six times the normal loss. (3) A high urinary indican was reported. (4) Ammonia forms a much larger part of the urinary nitrogen than in normal individuals. This is probably due to the extensive putrefaction taking place in the intestine. (5) The success with which a large portion of the intestine may be removed depends on a large degree on the condition of the intestine remaining. This fact was considered of great importance and should be considered carefully before extensive resections are undertaken. (6) A diet low in fat and moderately low in protein should be given in cases where much intestine has been removed.

H. R. M.

OPENSHAW, T. H.: CONGENITAL DISLOCATION OF THE HIP. (British Medical Journal, August 8, 1914.)

Openshaw advocates the earliest possible attempts at reduction, as with advanced cases the shortening and the rotation are constantly growing worse. All cases under the age of four can be replaced with certainty, but after this time the prognosis grows progressively worse, although exceptional cases have been reduced by successive manipulations even as late as sixteen or eighteen years of age. After five years simple reduction by the Lorenz method is possible, but is rendered far easier by tenotomy of the muscles and weight extension until the trochanter is well down, the head of the femur slowly stretching the constricted capsule. The hip is maintained in the abducted position for six months and the total duration of after treatment is at least eighteen months. When the head is much rotated the plaster is carried down to the ankle with the leg rotated inward. In case of anterior displacement the leg is put up in flexion for three months. In cases of relapse and in osteoarthritic cases the author uses open operation, avoiding injury to the cartilage of the head of the femur. The results are very favorable.

C. E. F.

MINOT, GEO. R.: NITROGEN METABOLISM BEFORE AND AFTER SPLENECTOMY IN A CASE OF PERNICIOUS ANEMIA. (Bulletin of the Johns Hopkins Hospital, November, 1914, p. 338.)

The first accurate work on the metabolism in pernicious anemia was carried on by Von Noorden in 1894. He was able to show that there was an increase in protein decomposition in this anemia. Subsequently, Von Stejskal and Eben, Strauss and Bloch found, in some cases, that there was a retention of nitrogen, probably due to an underfeeding or associated with periods of blood regeneration, as suggested by Mohr. Minot, working in the Johns Hopkins Hospital, was able to observe a case of pernicious anemia for many months, during which time he was able to carry on careful experimental work on nitrogen retention and excretion. The report of this case is intensely interesting, as it covers such a long period of observation and every detail of laboratory investigation necessary. In making his experiments on nitrogen metabolism Minot kept his patient in bed during all of the observations, giving a measured and weighed diet of protein, fat and carbohydrate in the proportions of 20:30:50 per cent. respectively. The calories were estimated by tables and the calory intake was low, being only 25 per cent. per kilo body weight, which, he says, is "barely enough for a patient in bed." In almost all of his observations the patient was kept on nearly the same diet for twenty-four hours before the experiments were started. The total nitrogen in the food, urine and stools was determined by the Kjeldahl method, the ammonia by the older Folin method and the urea was determined by the Marshall method, in each instance three samples being tested. Minot also gives a carefully worked-out table on the nitrogen metabolism in this case before the spleen was removed and after its removal. The total nitrogen output before splenectomy varied greatly daily, on one day being as high as 14.12 g. The average for four days, on which the output and intake was determined, showed a daily loss of nitrogen of .78 g. Following the removal of the spleen, the daily intake and output over six days (three periods, two days each) were more nearly equal each day. Minot, in concluding his article, says: "In a case of pernicious anemia, showing no improvement for three months, splenectomy was performed, after which the patient's general condition and blood mixture improved. With this improvement the urobilinogen disappeared from the urine, a more favorable nitrogen balance occurred and a rise in per cent. of urea-nitrogen, which previously had been below normal." R. D. M.

TAYLOR, DR. CHAS. J. G.: A FATAL CASE OF PURPURA. (The British Journal of Dermatology, October, 1914, p. 392.)

Taylor reports a case of purpura occurring in a well-grown boy of twelve years, which came under his observation at the London Hospital in 1913. The present history is as follows: He had been well until five days before admission, when he began to complain of a soreness of the throat accompanied by aches and pains all over his body, which were present at the time of his admission to the hospital. Two days later a rash appeared. The patient had the following previous history: Was in the London Hospital, 1911, with tonsillitis and a purpuric rash over the extensor surface of both feet and both arms. Later, this was followed by abdominal pain with symptoms of collapse and the appearance of blood in the stools. This purpuric rash came out in definite crops and he continued to pass large quantities of blood per rectum. After a few days he began to improve, but the rash continued to appear in crops for several weeks, while the hematuria persisted for three months. He was discharged from the hospital after a stay of some four months, practically free from symptoms. On re-admission to the London Hospital, in April, 1913, he presented practically the same symptoms as at the time of his former stay, except that they were more marked, and continued to increase in severity until his death, some six weeks later. Blood cultures and blood counts were negative. Postmortem examination revealed the following condition: A purpuric rash all over the body and, in some places, ulcers; the parts being most affected were the forearms, knees and feet. The stomach showed a severe catarrh of the mucous membrane with streaks of blood. On the posterior surface and near the lesser curvature an ulcer 1.3 cm. in diameter was found. There were a few shallow erosions scattered throughout the mucous membrane. On the greater curvature, and near the cardia, was another ulcer, which had almost healed. The small intestine showed a few irregular ulcers in the lower jejunum and ileum. The large intestine showed large embolic hemorrhages in the cecum, ascending transverse and descending colon, with numerous erosions throughout. The other organs showed small hemorrhages throughout their substance. Taylor calls attention to the fact that this is another case of the type of purpura complicated by visceral lesions so ably described by Sir William Osler, but that this case had all the leading characteristics of Henoch's purpura. The postmortem evidence suggests a very severe intoxication, probably originating from some focus in the alimentary tract, but the exact cause does not seem to have been determined. All forms of treatment which have been credited with producing good results in this disease were given a trial, but not one of them seemed to help in the least degree. R. D. M.

MAMOURIAN, M.: PRESENT KNOWLEDGE OF THYROID. (British Medical Journal, November 14, 1914.)

Mamourian's case was a four-year-old cretin, who had received faithful and persistent treatment with thyroid extract for three years. After six months of treatment by the author with 20 grains of the dried extract daily without results it was decided to try the effects of grafting. A sheep was killed while the child was being anesthetized and the thyroid removed, scarified and implanted in the child's omentum, which was also scarified. The gain was very pronounced, the child increasing 10 inches in height in four years and showing a very marked change for the better in his appearance and in his intelligence. He can read and write, tell the time of day, etc. An occasional 5-grain dose of the extract is given to overcome a defect in speech which develops at times. C. E. F.

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THE TUBERCULOUS FAMILY

(Continued from page 3)

room. Even the windows, extending from ceiling to floor, are arranged in three sashes, so that when open two-thirds of the space is unobstructed. On the roof is a spacious solarium, with hedges of privet and geraniums. A part of this solarium is reserved for the patients. Here in reclining chairs they take the cure. Another part of the roof is the children's playground. . . . Still another part of the roof is occupied by a fresh-air school."*

The medical treatment has been that of any first-rate sanatorium, rest in the open air and extra nourishment—tuberculin in a few cases. The results in the 45 adult patients who, among the 112 adult residents, had definite tuberculosis, show that 46.6 per cent. have been cured, 35.5 per cent. have had their disease arrested, 17.7 per cent. have been much improved—99.8 per cent. improved in all. Among the children the improvement was particularly good, their gain in weight being greater than that for normal children of the same age. "The pale, puny types, with sunken eyes and forlorn expressions, soon after admission to the hospital change to wholesome, bright-eyed, happy boys and girls." And not one well member of any family has shown signs of the disease!

Seventeen families have been rehabilitated physically and their earning power restored, or even increased; while, through the teaching they receive and the experience of the feeling of well-being due to sanitary living, these families are no longer liable to be foci of menace to the health of the community, but active centers for the spread of knowledge of how to live.

Moreover, tables of comparative expense show that this method has accomplished its end at a lower cost than could have been secured by any combination of sanatorium and institution treatment, while it preserved the family unit both in health and earning capacity.

A remarkable achievement, big with hope for a successful tomorrow!

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* "Two Years of the Home Hospital Experiment: Methods, Results and Comparative Cost of the Combined Home and Hospital Treatment of Families Made Dependent by Tuberculosis." Pp. 112. Illustrated. 1912-14. New York Association for Improving the Condition of the Poor, 105 East 22d Street, New York. Publication No. 84.

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ARCHIVES OF PEDIATRICS

FEBRUARY, 1915

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EDITORIAL

THE CLOSE OF A CHAPTER IN THE HISTORY OF CERTIFIED MILK

The period of anxiety to which the Essex County Milk Commission has been subjected during the fall of 1914 has borne fruit of considerable value to the producers of certified milk all over the country. That such an outcome has resulted is apparently due to the earnestness and reasonableness of the members of that Commission rather than to the sincerity of the criticism which was poured upon them in the early autumn. The Archives has no sympathy with attacks such as have been made upon those who are responsible for the production of clean milk by writers whose very manner of procedure proclaims to him who runs, that self-advertisement and not desire for the public good lies behind their articles. Such writers do but cast discredit on all their other writings and are responsible for a falling off in the estimation of intelligent men and women of the reputation of the newspapers that publish their attacks.

But we have much sympathy for the Essex County Commission and great respect both for the work they have accomplished in the twenty-two years past, during which they have pointed out the way so many have followed toward giving the not too appreciative public sanitary milk foods, and for the manner in which, having realized that the methods under which certified milk has been produced in the past may under certain circumstances be inadequate, they have gone ahead to detect the possible error and to secure from experts advice as to the prevention of its recurrence, advice which is authoritative and which will be of value throughout the country to all certified milk producers. The members of the Commission have shown themselves to be what anyone who did not view them with a jaundiced eye well knew them to be, loyal gentlemen, eager to carry out in letter and in spirit the requirements laid down in their contract with the Fairfield Dairy, and viewing with dismay and chagrin the appearance of a larger percentage of tuberculin reactors than is to be expected yearly in their herd.

Convinced that they had done everything to clean up the Fairfield Dairy certified herd by test and retest, they yet felt that it would be well in this instance for the sake of definitely establishing the safety of their milk and putting the most acid test possible to the whole proposition of the occurrence of reactors in a herd and the prevention of such occurrence. They therefore invited three of the most eminent veterinarians in the country to confer together over the evidence in the case, to examine into the causes for the outbreak of reactors in the herd and into the condition of the herd itself. They gave these gentlemen full sway, welcoming any criticism, however severe, that might be constructive. The report of Deans Moore, Klein and White is published in this number of the ARCHIVES. As a result of the work of these authorities the Commission has restored their certificate to the Fairfield Dairy, and so once again the premier certified milk farm is at work.

But this is not all. A situation which may arise anywhere that milk certification exists to confront and perplex any of the associated Commissions and which may cause public distrust of their certified milk has been met and overcome. The causes of its occurrence have been thoroughly sifted and recommendations from the highest authorities are now available by which such a situation may be avoided or, if it should occur again somewhere, may be again overcome. The pronouncement of Drs. Moore, Klein and White is the last word as to the situation in Essex County and as to the proper procedure for milk producers everywhere.

The report shows how difficult it is to gather a herd of tuberculosis-free cows and to keep them free from all traces of the disease. Buying cows from dealers who have picked them up in many places is one of the surest ways of importing tuberculosis into the herd. Even the tuberculin test may be deceptive here in unknown cows, because they may have been "plugged" by having been given a dose of tuberculin just before being sold, which procedure will vitiate any tuberculin test until, in the course of a few months, the animal becomes again susceptible to the test. Even cows from so-called clean herds may have tuberculosis and not show it when purchased, possibly because of their being in too early a stage of the disease. Therefore isolation must be practiced, isolation of all new cows from the cows already in the herd, for until a retest shall have established tuberculosis in such animals as are tuberculous or freedom from tuberculosis in such animals as are free, the animals which are infected may communicate their disease to older healthy members of the herd and to the spread of bovine tuberculosis in this manner, no one knows where the end might be. Yearly retesting of the whole herd should be made to cut out the small percentage of reactors who regularly appear under the best of circumstances and to prevent a wide spreading of the disease if some technical error has been made. It is even wise to prohibit the presence of any but tuberculosis-free cows in a farm which produces certified milk, for the danger to the certified milk herd is too great. The breeding of its own cows by each certified dairy is encouraged as the surest way to keep a herd clean. If such a programme is carried out as is suggested by the report, the annually occurring reactors in the best of herds—which may be only 1 per cent.—need not in any way be regarded as likely to cause the spread of tuberculosis through this milk. Such reactors would almost never have become transmitters of tuberculosis since their last test; and it seems impossible under the strictest care to prevent this slight annual occurrence of reactors.

We believe that the appreciation of the difficulties in the way of producing certified milk should enhance its value to all users and awaken a realization of its advantages over all milks less carefully produced. For those of us who must have absolute security against disease bacteria, and who wish to lay the bogey of bovine tuberculosis in man, the plan is open to use certified milk and to pasteurize it below the temperature of destruction of the enzymes, according to the method of Freeman, *in its final container,* be it nursing bottle or a small individual bottle which will suffice for individual portions of milk.

ORIGINAL COMMUNICATIONS

RENAL INFANTILISM.*

BY LANGLEY PORTER, M.D.

San Francisco, Cal.

In August, 1911, R. C., then seven and a half years old, the subject of this report, was referred to me by Dr. James T. Walkins, of San Francisco, whose advice had been sought by the child's parents on account of rapidly increasing flat-foot, which deformity had become so marked that walking was almost impossible. The mother stated that the child had been ailing since it was three months of age, up to which time he had been breast-fed and had done fairly well. There was great difficulty in finding an appropriate food and the child developed an obstinate constipation, from which he has not since been free. Vomiting has been a frequent event in his life and that without apparent cause. The parents have never been able to get the child to take much solid food, so the diet has been chiefly of milk and gruels.

Pneumonia at six months and a middle-ear abscess at two years are the only illnesses reported by the mother, although one physician has stated that the child suffered from an albuminurea.

The chief complaint, apart from the child's deficient size and weight, is that he has difficulty in locomotion and seems very pale. The child is of exceptionally alert mentality.

Physical examination revealed a very small child; weight, 32½ pounds (average weight of a seven-year-old boy, 49½ pounds). The child is very well proportioned and very well made; slight rachitic thickening of the wrists; feet, arches flat; legs, slight bending of lower third of femur; well-marked Harrison's groove; posterior cervical glands palpable; anterior cervical not palpable; axillary glands palpable on both sides; epitrochlear glands not palpable; on inspection, chest is normal. On the left side there is dullness in the second interspace and over third rib, as far as the mid-clavicular line, thence to the apex beat in the sixth interspace in the anterior axillary line; on the right the dullness is one-quarter inch outside the right sternal border. On heart auscultation a loud systolic murmur is heard at the fourth rib half way between apex beat and the sternum; it is carried very loudly out into the axilla; at the back it is heard best in the scapular line; the murmur is almost as loud at the base in the pulmonary area as it is in the area of maximum intensity; it is heard very well all over the upper part of the right chest in front; the second pulmonic sound is well heard, also the second aortic; spleen is enlarged; liver is not enlarged; testicles both descended; sexual development normal; skin is pale and dry and hair is dry; no rashes; mucous membrane pale.

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* From Medical Department, Leland Stanford, Junior, University.

Blood Examination. — Hemoglobin, 60 per cent.; White blood cells, 11,600; polymorphonuclears, 55 per cent.; lymphocytes, 44 per cent.; eosinophiles, 1 per cent. No degenerated forms. No nucleated forms.

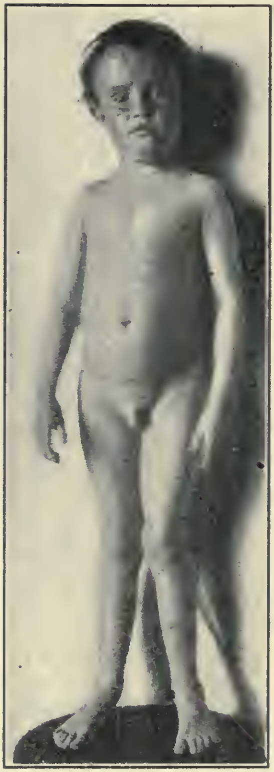
Stools.—Pale, milk-diet stool; neutral fat, none; fatty acid, small amounts; soap moderate; starch much.

Urine.—Pale; specific gravity, 1,010; albumin, present; sugar, 0; indican, 0; casts, 0; no epithelium; no pus.

X-Ray.—At cranial base, sella turcica normal. Incompleteness of calcification in all diaphyses. Ossification absent in wrist bones.

The diagnosis of infantilism with congenital cardiac disease was made.

A change from milk diet was ordered and the urine ordered measured. On three successive days the child passed 40, 54 and 43 ounces. As soon as the milk was abandoned as a main diet the child developed an intense desire for water and it was impossible to measure his daily intake of fluid.



CASE I

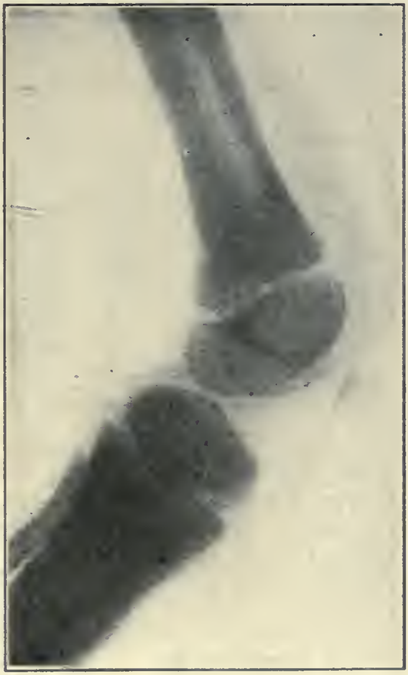
Fig. 1. Aged 9½ years; height, 34½ inches; weight, 29 pounds. Showing marked knockknee and deformity of ankle joint.

The patient was kept under observation and the urine was examined from time to time. A few granular casts were almost invariably found, although they did not appear on the occasion of his first visit and the quantity of daily urine varied from 28 to 55 ounces, usually 40 to 46 were passed. His bladder was of enormous capacity, as he often voided 16 to 18 ounces at one occasion and this when his weight had fallen to 28 pounds.

After another six months the deformity of the feet was much more marked and the slight bending at the lower one-third of the femurs was decided, so much so that the parents were anxious for mechanical supports to be applied. Both Dr. Watkins and Dr. Harry Sherman, who were consulted, agreed that such appliances were useless. The child was otherwise happy. His only complaint was that he could not run about as other boys did.

About this time, Reginald Miller published an article in the British Journal of Children's Diseases (July, 1912), describing cases of infantilism and skeletal deformity associated with renal damage, chiefly of the interstitial type, alone or combined with cardiac insufficiency.

According to Miller, Morley Fletcher first described cases of this sort, but it was May who suggested the renal element as deficient. The infantilism varies in degree, but it is usually marked; the mental power may be but slightly impaired or even, as in this case, extremely good. The mental development is said in most cases to correspond to the stature rather than to the age of the patient. When there is no organic disease in the kidney and the renal element is expressed merely by polyuria, the infantilism is apt to be less extreme. In a number, though not in all, of the cases genu valgum was a marked feature and seems to express the beginning of a final stage in the disease. The striking symptoms com-



CASE I

Aged 9½ years. X-ray of knee joint showing incomplete calcification of diaphyses. Epiphyses correspond to much younger age.

mon to all the cases reported were polydipsia, polyuria, thirst, enuresis and dry skin. The symptoms may have existed from birth or may have begun in the earlier years of the child's life; in the first group the infantilism would be most extreme.

Miller arranged his cases in groups—(1) renal infantilism with organic renal disease (chronic interstitial nephritis); (2) renal infantilism without organic renal disease (diabetes insipidus). The first group is subdivided into cases with cardiovascular changes marked, slight or absent.

Of Morley Fletcher's 2 cases, 1 came to to autopsy after death in uremic convulsions. The pathologic findings were of chronic interstitial nephritis. The same findings are recorded by other authors in their cases.

Naish reported cases with a negative Wassermann reaction with onset of symptoms at the fifth year; this patient not growing afterwards. Two of his cases, sixteen and nine years of age, gave the relative appearance of children of nine and four. Autopsy gave a picture characteristic of chronic interstitial nephritis.

A comparison of the writer's case with those of Miller seemed to show that it fitted naturally into the class of renal insufficiency accompanied by a heart lesion of congenital type.

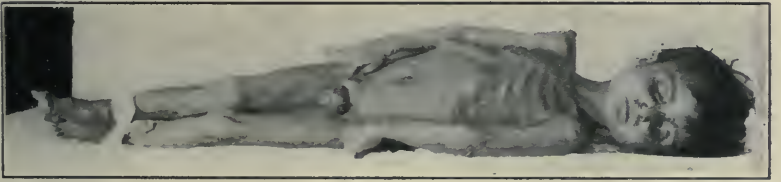
The child was sent to Lane Hospital, where we hoped to study the metabolism, especially with regard to calcium intake and excretion, but he proved so intractable that it was impossible even to gather the urine, which he would void in bed, hoping to be sent home for misbehavior.

The notes of his examination in August, 1912, a year after our first examination, show that the weight had not increased and that he had gained only one-half inch in height. The chief change was to be found in the skeleton. The radial epiphyses were now so enlarged that in comparison with the small, well-formed hands there was almost the appearance of a dinner fork deformity. The knees touch when the feet are several inches apart on the floor. The lower extremity of the tibia is somewhat enlarged and bows slightly forward, giving the small, delicately formed foot an appearance of being set forward on the ankle. The Wassermann reaction was found negative.

The hemoglobin was 50 per cent. the red cells, 2,800,000; white cells, 19,800; polymorphonuclears, 66 per cent.; lymphocytes, 28 per cent.; large mononuclears, 2 per cent.; eosinophiles, 4 per cent.

Urine.—No albumin; granular casts present; no pus; specific gravity, 1,010; amount, .55 ounces. On subsequent occasions the quantity was high, the specific gravity low. Albumin varied from 0.5 per cent. to none. Casts were uniformly present. Bence Jones albumose was never found.

On my last sight of him, in October, 1913, the boy was still alive but weak and with such bending of the femurs and tibiæ that he could not stand erect and was reduced to a wheel cart. His parents had found a physician who was willing to yield to their importunate demand for mechanical aid and the child was wearing plaster casts, so that any examination was precluded. However, the cases gathered by Miller lead us to believe that death follows within a year or eighteen months after the development of marked knock-knee.



CASE II

Aged 6 1-3 years; height, 31 inches; weight, 21 pounds.

I will add to this history a second. The patient was admitted to Lane Hospital, Children's Department, during my absence, and I am indebted to Dr. Leach, the house officer, for the data. The case seems to belong to the group of true renal infantilism without cardiac involvement and to have succumbed to a pyelitis before any marked skeletal deformity had occurred.

Jack Antone, Case No. 15,104, Lane Hospital, February 11, 1914, age six years and four months. Complaint: headache, chills and vomiting.

Family History.—Mother and father alive and well; only child; no miscarriages; no history of tuberculosis in the family.

Past History.—Instrumental birth—long, difficult labor; breast-fed first month; malnutrition after first month, fed on malted milk, condensed milk and cow's milk; birth weight, 7½ pounds; walked at four years; talked at three years; none of the ordinary diseases of childhood; nocturnal urination all life; came to Cooper Clinic when twenty-two months old and diagnosis of malnutrition and congenital malformation of the urethra was made; polydipsia; breath always foul; has always passed large quantities of urine at frequent intervals.

Present Illness.—Began last Sunday (three days ago) with chills, pain in stomach and vomiting; no tenderness over abdomen complained of; severe headaches almost continuous for past three years; weight has remained the same for the past two years.

Physical Examination.—A poorly nourished male, labored respiration, odor of urine on breath. Apparently in great pain and at times complaining of pain in head. Age, six years, four months; weight, 21 pounds; height, 79 cm. Expression on face of an old person; eyes rolled up and inward; lids closed most of the time. Pupils dilated and react very sluggishly to light. Tongue coated; teeth very poorly kept and preserved.

Chest.—Rachitic rosary very pronounced; marked Harrison's grooves. Two sides of chest move equally on deep respiration. No areas of dullness on percussion; slight impairment of resonance at both bases posteriorly.

Heart.—Impulse visible and palpable in the fifth interspace; area of cardiac dullness not increased; no murmur heard; pulse fairly strong and regular.

Abdomen.—Both kidneys palpated; very slightly painful; small. Abdominal type of respiration. No visible peristalsis. No palpable tumor masses. Liver border palpated about 1 cm. below costal margin. Spleen not palpated. No rigidity of the abdominal muscles; skin over abdomen dry and wrinkled.

Genitalia.—Malformation of the urethra; one urethra passing back to bladder and another ending in a blind sac about half way back.

Extremities.—No edema of feet or ankles; toes in extreme dorsal flexion. Hands clenched; legs rigid.

Reflexes.—Abdominal, positive; patellar, very much exaggerated; Achilles, exaggerated and equal; Kernig, positive.

Diagnosis.—Pyelonephritis; congenital malformation of urethra; uremia; pulmonary edema (possible malformation of kidneys); "renal infantilism."

Laboratory Findings.—*Blood.*—Red blood cells, 4,400,000; hemoglobin, 85 per cent. (Dare); white blood cells, 19,600; polymorphonuclears, 78 per cent.; lymphocytes, 20 per cent.; large mononuclears, 1 per cent.; eosinophiles, 1 per cent. *Urine.*—Cloudy; straw color; specific gravity, 1.009; albumin; very heavy cloud; casts, none seen; pus cells, loaded; red cells, none seen.

Death.—February 12, 1914. Uremic coma. No necropsy allowed.

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ICE FOR PRESERVING FOOD.—J. R. Williams, Rochester, N. Y. (*Journal of American Medical Association,* September 20th), has studied the refrigerator problem in Rochester, N. Y., and in the study of 243 ice-boxes he found only 103 that had a temperature of below 50°F.; the majority are therefore failures as far as preserving food from bacterial decomposition is concerned. The main reason for the inefficiency of these refrigerators is in their defective construction. The data gathered by this investigation justify the following conclusions: "(1) The temperature of cellars or living-rooms in dwelling-houses is not sufficiently low during the warm months of the year to protect milk and other perishable foods from rapid bacterial decomposition. Therefore an efficient refrigerator in the home is a necessity. (2) Most of the refrigerators in common use are almost worthless and grossly uneconomical. (3) There is a large field for the manufacturer who will make a properly insulated and efficient box which can be sold at a moderate price. (4) If more economical methods of ice manufacture and distribution were employed, the cost of ice to the consumer could be materially lowered. (5) If to this saving were added that which would result from proper ice-box construction, refrigeration vastly superior to that now found in the average home could be had for at least one-fourth the present cost."

CUTANEOUS REGIONAL VARIATION IN THE PIRQUET REACTION.*

BY JOHN ADAMS COLLIVER, A.B., M.D.,

Los Angeles, Cal.

My excuse for this short report is that Professor Pirquet was interested enough in the subject to ask me to make an investigation as to how the different parts of the body reacted to his cutaneous tuberculosis reaction. He said that no one had investigated this phase of the work and that many had asked him if there was any difference. The whole Kinderklinik was placed at my disposal and nearly a hundred children were tested or Pirqueted. In the rush of the war, however, I regret to say that I have lost part of my records and am now able to report and tabulate only 50 cases.

Method.—In this report no infants or cases from the tubercular wards were used. In other words, only obscure cases—cases showing the positive tubercular reaction as a result of the routine Pirquet made on admission and under treatment for some other disease. It is impossible and not the purpose of this paper to discuss the clinical phase. The parts of the body selected for the test were the dorsum of the hand and foot, knee (inside), shoulder, neck (either side of the ver. prom.), back (sacroiliac) and the routine place—the ulnar side of the forearm. Undiluted old tuberculin was inoculated with the Pirquet drill. In America I find many substitutes for the drill, such as knife and needle scarification and drills made of toothpicks and watch screwdrivers. All of these serve the same purpose, but for accurate observations and measurements are not dependable. After inoculation no dressing was used, only a small piece of sterile cotton applied and allowed to dry in the tuberculin. Measurements and observations were made every two hours after the inoculation for the first fourteen hours; then beginning the next morning every four hours for the next twelve hours, and every six hours thereafterward until the reaction reached its maximum intensity. The measurements consisted in taking the actual dimensions of the congested area as indicated by the color. Observations consisted in noting the color and the induration. The latter is estimated by the elevation above the surrounding tissue.

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* From Professor Clemens Frh. v. Pirquet's Kinderklinik, Vienna.

Object.—These tests were made in an endeavor to determine if any part of the skin of the body was more susceptible to the tuberculin reaction than another. In order to judge properly, the results were tabulated into four groups. First, the part of the body most susceptible to the traumatic reaction. Second, the part where the reaction appears first. Third, the part giving the strongest reaction as indicated by the extent and duration of hyperemia. Fourth, delayed intensity of reaction.

THE ANALYSIS OF 50 PIRQUET REACTIONS MADE IN DIFFERENT PARTS OF THE BODY. (MADE IN PROFESSOR PIRQUET'S KINDERKLINIK, VIENNA.)

Part of Body.	Traumatic Reaction.			First appearance of a Positive Pirquet Reaction.			Greatest intensity Pirquet reaction reached.		
	None.	Small.	Large.	Less than 24 hours.	Between 36 and 48 hours.	More than 48 hours.	24 hours.	Between 36 and 48 hours.	More than 48 hours.
Hand (dorsum)	15	33	2	42	8	0	3	31	16
Foot (dorsum)	18	30	2	46	4	0	2	14	34
Knee	26	22	2	39	10	1	1	31	18
Shoulder ...	6	32	12	47	2	1	3	33	14
Neck near ver. prom..	8	40	2	50	0	0	7	35	8
Back (sacro-iliac)	5	30	15	47	2	1	3	31	16
Forearm ...	7	41	2	46	3	1	3	34	13

Traumatic Reaction.—By this we mean the local congestion surrounding and immediately following the inoculation. When present it usually lasts from two to eight or ten hours. Sometimes it even runs up to and into the positive Pirquet reaction, making it impossible to tell where one begins and the other ends. The character of the traumatic reaction depends upon the technique and the condition of the skin.

A glance at the table will show that about 25 per cent. of all the inoculations are followed by no traumatic reaction; that is, there was no inflammatory area at all. It also shows that this reaction varies somewhat in different localities. For instance, there is no traumatic reaction in 52 per cent. of those done on the knee, 36 per cent. for the foot, 32 per cent. for the hand. The part of the body most universally used for the Pirquet—namely, the forearm—showed 14 per cent. non-traumatic reaction and 82 per cent. only small reaction. The parts showing the largest traumatic reaction were the back and the shoulder, the former being 30 per cent, large and the latter about 25 per cent. By large I mean that the area of the inflammation is large compared with the positive Pirquet which follows, or when it measures over 7 x 7 or 8 and is congested and infiltrated. The places exhibiting the largest traumatic reactions are apparently over vascular areas and soft parts.

The First Appearance of a Positive Tuberculin Reaction.—It will be noticed by the table that 98 per cent. appear before forty-eight hours and that 90 per cent. appear before twenty-four hours. If we eliminate the knee, where the appearance is slowest, this percentage reaches as high as 93 per cent. It must be remembered that these experiments were not made on doubtful cases—all had previously shown a positive Pirquet.

The Greatest Intensity.—The largeness and intensity of reaction generally coincides with the retarded reactions. The intensity is judged by the redness and the infiltration or elevation. It is longest delayed in the foot, nearly 70 per cent. appearing after 48 hours, whereas of all the others 65 per cent. is most intense between thirty-six and forty-eight hours. In only 6 per cent. was the maximum intensity reached by the twenty-fourth hour, with the exception of the back of the neck, which is 14 per cent. The foot, knee and back show the largest. When the reaction is large in one part of the body it is usually large in the others. The largest recorded in this report was 50 x 43 mm. of redness, with a central white elevation of 10 x 12 mm., and this was on the foot and back. The large reactions were usually accompanied by radiating lines of reddened lymphatics.

Other Phenomena Observed Relative to the Pirquet Reaction.—The reaction is generally more intense in the infections just started or where there has lately been an exacerbation. On the other hand, it is absent in chronic or emaciated tubercular children and often in miliary tuberculosis with tubercular meningitis. In these cases I have found it more times positive in the sacroiliac region than other places.

In diabetes, when the Pirquet is positive, it is usually more intense and of a different character and often followed by necrosis.

In measles, as is known, it is absent during the first week and appears in a manner similar to the disappearing rash.

The question has been asked me several times if children are more susceptible to subsequent inoculations in the event of the first is doubtful or negative. When cases were doubtful we seldom made a second Pirquet, but at once made a Mantoux. This usually brought out the old Pirquets and subsequent Pirquets were more intense.

There is no good reason for making the Pirquet tubercular cutaneous test elsewhere than on the forearm, and this location has the advantage of being more convenient.

Baker-Detwiler Building.

ASTHMA IN CHILDREN.—E. B. Smith (*Practitioner,* 1913, Vol. XC., p. 924) has kept notes of 36 out of 40 cases of asthma in children under twelve years of age. These show that it affects the sexes about equally and that the history of heredity is marked. The dry, adult type, with its intense dyspnea is not common before five years of age; but there is a distinct type of infantile asthma which may commence almost as early as birth. There are two distinct types to be met with in children. One may be said to affect children between birth and five years, and the second, which closely approximates to the adult type of the disease, generally makes its appearance between five and puberty. Where there is a predisposition to asthma, the presence of adenoids or any other lesion of the upper respiratory passages, or an unhealthy state of many other parts of the body may give rise reflexly to an asthmatic paroxysm. Regulation of the bowels in a case of chronic constipation may effect a cure when iodids, belladonna and other antispasmodics have failed. The rickety and ill-fed baby with an asthmatic inheritance will have repeated attacks until the rickets or the diet is corrected. On the other hand, a permanent cure should not be promised when removing adenoids or cauterizing septums. If the attempt to relieve the patient by the careful elimination of all possible sources of irritation has failed, and a suitable habitat has not been found where he or she is free from attacks, it will be necessary to fall back on drugs as a last resource.—*American Journal of Obstetrics.*

A NOTE ON THE USE OF LIQUID PARAFFIN IN INFANTS *

BY HOWARD KENNEDY HILL, M.D.

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Liquid paraffin, officially known as petrolatum liquidum, is also known under a variety of names more or less proprietary, such as liquid albolene, olo, rusol, liquid petrol, white liquid vaselin, liquid cosmolin, Russian mineral oil, parafinol, etc. It consists of a mixture of hydrocarbons of the Series $C_n H_{2n+2}$—known as paraffins, is tasteless, odorless and transparent, and neutral in reaction. It is insoluble in water, scarcely soluble in alcohol or in cold absolute alcohol, but is soluble in boiling absolute alcohol, and easily so in ether, chloroform or oil of turpentin. It is well to filter it through silk.

Being a refined mineral oil, apparently entirely produced in Russia, it acts purely and simply as a mechanical lubricant without undergoing any chemical change or decomposition, and without being absorbed, putting no extra strain upon the pancreas or the liver, whereas, with animal or vegetable oils, fat indigestion is often brought about.

Liquid paraffin was first given internally by Archibald Randolph and Samuel G. Dixon in 1884, working in the Physiological Laboratory of the University of Pennsylvania.

For three or four years Sir W. Arbuthnot Lane,[1, 2] the distinguished Senior Surgeon to Guy's Hospital, London, has been laying especial emphasis upon chronic intestinal stasis and its far-reaching consequences. In his address before the students in medicine of the University of Pennsylvania in 1912, he pointed out the results of the primary absorption of poisonous products from the large intestines, and the secondary results of their absorption, as from suppurating gums, or from any secondary infectious process, communicating or not with the gastrointestinal tract. He agreed thoroughly with Metchnikoff that the large bowel is responsible, Metchnikoff even going so far as to say that man would live forever if he could prevent his large bowel from absorbing toxic products or from having them to absorb. When, however, there is a damming back of the contents of the large intestines, an engorgement of the mucous membranes of the small intestines, even of the duodenum, is produced, and ulcers, perforations and cancer may result. We may have, in addition to pyorrhea alveolaris, rheumatoid arthritis, the disappearance of which upon the removal of part of the colon constitutes, in the hands of Lane, one of the most remarkable results of surgery.[4] The Mayos do not recommend this operation, and the splendid results obtained by Pemberton[5] in his studies in metabolism and proper feeding in arthritis deformans, while showing that an operation is not necessary, at the same time show the guilt, in many cases at least, of the intestinal tract. We may simply mention, among the other results, that the pancreas may become infected directly by extension from the stagnating contents of the duodenum, resulting in chronic induration, inflammation and finally cancer. Pancreatic diabetes may appear, and there may also occur tubercular infections; infections of the genito-urinary tract; Still's disease; mucous and ulcerative colitis; the so-called American gout with its skin manifestations; and many complications of the nervous system, including even epilepsy, with petit and grand mal. Naturally the liver is the most important organ in converting the poisons, and the kidneys and the skin in eliminating them. In the relief of these conditions, Lane recommends, in conjunction with the operation, the use of liquid paraffin, giving it in sufficiently large doses, always just before each meal, and relying solely upon its action as a lubricant, as it is not capable of being absorbed. He also recommends the taking on of fat so as to increase the weight of an adult by about 20 pounds to restore the wasted voluntary and involuntary muscles, and the use of a spring support or corset which presses on the abdomen below the umbilicus and overcomes any visceroptosis present.

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* Read before the Philadelphia Pediatric Society, January 12, 1915.

It is of the utmost importance that we realize that the necessity and duty of guarding against the beginning of this widespread condition, *i.e.,* chronic constipation in infants, rests with the pediatrist, so that its results will not become manifest later on in life, when some extra strain is placed upon the body.

Chronic constipation is primarily found in so large a percentage of infants because of the anatomical fact that the eighteen or twenty feet of intestines are squeezed into so small an abdominal cavity. Add to this the habit of giving drugs which relieve the intestinal muscles of their duty and so favor gradual relaxation and atrophy thereof; the failure to adopt regular habits of going to stool, improper feeding and other causes, and it is no wonder that the condition is common.

Lane states that a delay of fecal matter in the large bowel causes small membranes to be formed, which fix the bowel and prevent downward displacement. The first to form is that which fixes the large intestines in the left side to the brim of the pelvis, and this tends to reduce the freedom of the passage of material through this part of the colon, which Lane calls the "first and last kink,"[3] the first to be formed and the last or lowest obstruction in the gastrointestinal canal.

Sir Arbuthnot Lane also mentions the strange fact that the color of the hair has much to do with the changes produced. The darker the hair, the more marked is the tendency to degeneration from autointoxication. In the case of red hair, the symptoms are slight and it would seem to be a great advantage to have red hair.

For chronic constipation in infants, we began the use of liquid paraffin in the Children's Dispensaries of the Howard Hospital and the Presbyterian Hospital a little over a year ago, and, although the doses given at first were too small, we soon found that from one-half to one fluid ounce before a morning and an evening bottle each day served to overcome the constipation. The dose could be gradually reduced, and when omitted for a day there was not the increased constipation which is the rule the day after castor oil is given. At first we did not realize that satisfactory results should not be looked for until three or four days' treatment had been pursued. Of course, proper and regular feeding, and a fixed time, twice a day, to train the baby to have a stool, must be insisted upon. Until we began the use of liquid paraffin we advised the use of an old-fashioned castile soap stick or a gluten suppository, but not a glycerin suppository, as it was found to be too irritating. If these were not sufficient, a soapsuds enema was added, and at the same time either the fat was increased in the milk mixtures, orange juice was given midway between bottles, or gentle massage of the abdomen by the hand or by the cannon-ball method was suggested. We have only given agar-agar to a few babies.

Last summer, in the Babies' Hospital at Wynnefield, nearly every baby admitted to my service during May, June and July suffering with severe gastroenteritis or ileocolitis was given an initial dose of liquid paraffin instead of castor oil. Although the size of the dose, 2 drams, may have been too small to have warranted us in drawing the conclusion, we nevertheless returned to castor oil for those babies admitted during the last ten days of July. It seemed to us that we did not obtain as free and complete a clearing out of the tract, and the secondary constipation after castor oil was, in these cases, desirable.

In nearly all of our cases we have combined the use of Bulgara tablets with the use of liquid paraffin, and we believe this combination is especially indicated and will give remarkable results in a certain proportion of infants and young children suffering with asthma, some varieties of diabetes, migraine, cyclic vomiting, convulsions, epilepsy, enuresis, some forms of eczema, in the so-called idiopathic edemas, and in many severe teething cases.

CONCLUSIONS

(1) In the chronic constipation of infants, liquid paraffin in large doses gives the best results we have yet obtained.

(2) In severe gastroenteritis and ileocolitis its use was disappointing, possibly because too small doses were given.

(3) In conjunction with lactic acid bacilli very remarkable results may be obtained in that group of diseases which are caused by the action of putrefactive or allied poisons absorbed from the intestines and finding a favorable, susceptible, sympathetic nervous system.

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EDEMA COMPLICATING GASTROENTERITIS *

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Edema has been frequently discussed in pediatric literature, especially since 1887, when Wagner, excluding all cases presenting heart or kidney lesions, anemias, or other known etiological factors, suggested the terms essential, primary or idiopathic edema. The intervening years have brought forth a considerable amount of clinical data and much theorizing, but as yet little research work has been done in this particular field.

There are three important theories advanced to explain the etiology of this interesting condition. The first, upheld by Cassel, presupposes a hidden or latent nephritis. The second, supported by Hutinel, who applied the theory as advanced by Widal and Javal, to his observations on children, holds the chlorid retention responsible for the hydremia and resulting edema. The third, advanced by Cohnheim, predicated the increased permeability of the walls of the capillaries as the etiological factor.

Referring to Cassel's contentions, we note that 4 of his 9 cases were preceded by an exanthematous disease, which might easily explain the findings of renal congestion at autopsy as reported by him. None of his cases presented clinical evidences of nephritis, there was no uremia in the terminal stage, and the location of the edema was not that of nephritis. The rapid recovery usually encountered in these cases, and the fact that a hidden or latent nephritis eventually appears as a frank attack, would seem to show that this theory is not well grounded.

The work of Widal and Javal was widely accepted and led Hutinel and many others to support the theory of salt retention. This was an especially attractive theory, as in many instances it was possible to make the edema appear or disappear as the chlorid intake was altered. Hutinel claims that three factors, acting singly or in unison, bring about salt retention—(1) a lessened permeability of the kidneys and other organs which excrete salt, (2) a defective circulation through both the vessels

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* Read at the January, 1915, Meeting of the Philadelphia Pediatric Society. (For discussion, see page 140.)

and heart, and (3) certain changes occur in the tissues which affect osmotic pressure.

Cohnheim's theory of blood changes, weakened systole of the heart, and increased vascular permeability, takes for granted a circulating toxin to produce these changes. Filatoff, Stolzner, and others, have written in support of the action of various toxins.

In the 4 cases herewith reported, the degree of malnutrition was slight in 2 and moderate in 2; there was a moderate degree of anemia in all the cases, the hemoglobin varying from 70 to 80 per cent., the red blood cells from 3,400,000 to 4,700,000, the white blood cells from 6,780 to 13,360. The duration of the edema was respectively four days, fourteen days, seventeen days and thirty-two days. The gain in weight due to edema varied from 1½ to 3½ pounds. The edema disappeared in from five to eleven days after treatment was instituted. There was 1 case of enteritis, 1 of ileocolitis and 2 cases of gastroenteritis.

The clinical picture presented by this series was that of a generalized edema, with marked puffiness about the eyes, the dorsum of the hands and of the feet. Pitting on pressure was also noted. The child was fretful, uncomfortable, and objected to being handled. The temperature was usually subnormal at the height of the edema. The urine was passed freely and did not show any evidence of either chemical or microscopical abnormalities. Examination of the heart and kidney areas was negative. In general there was fever, moderate anemia and loss of weight, followed by a rapid onset of edema.

Considering treatment, it is first necessary to combat the underlying disorders of the digestive tract. This is best accomplished by the administration of castor oil, colon irrigations, lavage, alkaline diuretics, and feedings of soy bean gruel, to which later milk is added in appropriate proportions. In so doing, we maintain a low chlorid intake and favor elimination of chlorids previously retained, at the same time combating the formation of toxins of the already existing toxemia.

CASE I.

Name	E. H.
Age	7½ months
Case number	666
Diagnosis on admission	Gastro-enteritis

CASE I.—*Continued*

Degree malnutrition	Moderate
Anemia	Red blood corpuscles, 4,700,000; white blood corpuscles, 9,200; hemoglobin, 80 per cent.
Cardiac condition	Negative
Kidney condition	Negative
Urinary findings	Negative
Previous feedings	Soy bean, second strength 2 days, one-third milk and soy bean 2 days, one-half milk and soy bean 5 days
Duration edema	4 days
Temperature	Negative
Increase weight with edema	2 pounds
Number days for disappearance	5 days
Complications	Edema
Results	Recovery
Remarks	Colored child, male of 7½ months; was at day nursery 4 months before admitted to Babies' Hospital—edema began second day after admission. Never was very sick; edema slight; worse around eyes, ankles and prepuce. Child has umbilical hernia. Child went home well and in good condition. Whole milk 8 oz. 4th hour. Urine negative, gastroenteric condition cured—complicating edema entirely cured.

CASE II.

Name	M. T.
Age	10 months
Case number	736
Diagnosis on admission	Ileo-colitis
Degree malnutrition	Moderate
Anemia	Red blood corpuscles, 3,470,000; white blood corpuscles, 13,360, hemoglobin, 70 per cent.
Cardiac condition	Negative
Kidney condition	Negative
Urinary findings	Negative
Previous feedings	Two-third milk and sugar when admitted to hospital—after admission soy bean alone for 3 days, then one-third milk and soy 5 days

CASE II.—*Continued*

Duration of edema.............	14 days; had edema 2 days before admitted
Temperature	Very irregular, especially during height of edema, never above 102° F.
Increase weight with edema....	Probable increase 1½ lbs.; weight on admission uncertain
Number days disappearing......	7 days
Complication	Edema
Results	Recovery
Remarks	Patient fairly well nourished colored girl of 10 months; came in house with edema of two days' duration; vomiting and bad stools began 3 weeks prior to edema. Some signs of rickets in bones, stools bad, greenish mucus, child very restless, didn't like to be handled. Bulgara tablet (one-half Ac. and P.C., sugar water) seemed to help stools. Temperature was very irregular during height of edema, instead of usual tendency to be sub-normal. Potassi citratis given. Horse serum (10 c.c.) for blood in stools. Ileocolitis cleared up—edema cleared up and child went home apparently recovered.

CASE III.

Name	E. H.
Age	3½ months
Case number	752
Diagnosis on admission.........	Gastroenteritis and edema
Degree of malnutrition.........	Slight
Anemia	Red blood corpuscles, 3,400,000; white blood corpuscles, 6,780
Cardiac condition..............	Negative
Kidney condition...............	Negative on admission
Urinary findings after first 6 days	Reaction—acid Color—cloudy Sp. Gr.—1,015 Albumin—present Sugar—absent

CASE III.—*Continued*

	MICROSCOPIC EXAMINATION Much sediment Many pus cells Many motile bacilli (colon) Few cells of renal and bladder type Few ammonium urates Few granular casts
Previous feedings.............	Three weeks nothing but barley and albumin water. Soy bean 3 days; followed by one-third milk and soy bean as diluent for 8 days; followed by one-half milk and soy bean diluent 14 days
Duration of edema............	32 days
Temperature	Very irregular (pyelitis)
Increased weight with edema...	2 pounds and 12 ounces
Number days disappearing......	11 days
Complications	Edema, pyelocystitis
Results	Death
Remarks	Female patient of 3½ months; admitted to hospital with marked generalized edema; been on barley and albumin water for three weeks previous to admission. Stools on admission greenish with mucus; temperature 100° F. and ran rather typical pyelitic curve. Patient given alkalin treatment, citrate of potash, and urotropin; a few red blood cells found in urine and urotropin stopped. Stools continued bad, food refused, and occasional vomiting. Gradual loss of weight. Bulgara tablet one-half gr. Ac. and P.C. in sugar water for 18 days. Autogenous vaccine made, colon bacilli, and 25,000,000 given for initial dose. Repeated fifth day; increased by 25,000,000 each additional dose. Patient seemed brighter, gained slowly in weight, no marked vaccine reaction, stools better. Reinfection of colon organisms with rise in temperature, enormous shower of bacilli and pus cells in urine. Refused feedings, became very weak, was put on wine whey, but gradually grew worse, with death on the 61st day.

CASE IV.

Name	J. S.
Age	18 months
Case number	786
Diagnosis on admission	Enteritis
Degree of malnutrition	Slight
Anemia	Red blood corpuscles, 3,500,000; white blood corpuscles, 12,300
Cardiac condition	Negative
Kidney condition	Negative
Urinary findings	Negative
Previous feedings	Soy bean 6 days, first strength (1.4—.6-3) calories per 4 ounces Casein 5 days (2.5—1.5-3) calories per 11.8 ounces
Duration of edema	17 days
Temperature	Elevated to 103° for 3 days. Normal 2 days (height of edema), was then subnormal 3 days, then normal
Increase of weight with edema	3½ lbs.
Number days for disappearance	9
Results	Recovery of enteritis and edema
Remarks	No edema on admission. Edema came on very suddenly with great puffiness. Child very uncomfortable. Marked pitting on pressure. Temperature elevated for three days to 103° F. No ear discharge, chest clear, urine negative, throat slightly infected, von Pirquet positive. During height of edema temperature was subnormal, but weather was very cool at this time. Urine never showed any signs of renal lesion. Was on soy bean during height of edema. This was stopped and patient given only water for 24 hours, followed by large outlet of urine which was colorless. Potassium citrate, gr. 5—second hour given for 8 days. Never any signs of pyelitis. Bulgara one-half tablet Ac. and P.C. in sugar water was given, which seemed to aid in clearing up the stools. Patient sent home on soft diet and whole milk; seemed happy and in good condition. Stools soft yellow. Edema entirely cleared up. Gaining rapidly in weight.

THE RELATION OF THE PEDIATRIST TO THE COMMUNITY *

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The seventeenth year of our Society has been sufficiently remarkable in a number of respects as to be worthy of comment. Dr. Gittings[1] in his presidential address expressed the opinion that the attendance upon the meeting of a society is the true index of the vitality of that society, so we may feel justly proud of our average attendance of 107 for this year, not including the present meeting. And not only in point of numbers has our progress been marked, but in the character of the papers presented and the distinguished guests it has been our good fortune to attract from other cities. While at present our Society is recognized as one of the leading medical societies of Philadelphia, it is the ambition of your Board of Directors to place it where it properly belongs: among the leading societies of its kind in the entire world. The work of the Board of Directors and the Committees has been characterized by an earnestness and perseverance which have contributed most largely to the success of our meetings. To them is due the thanks of the Pediatric Society for their devoted service. Especial mention must be made of the very excellent work of the Committee on Scientific Programme, for it is to them we look for the success of our regular meetings. Our records show that the programmes they have prepared for us have resulted in a larger number in attendance than ever before.

Further retrospection will avail us little. It is our responsibilities to the immediate future about which we are most concerned, and I desire to use the time at my disposal in an attempt to direct your thoughts to their consideration. On our willingness to undertake these responsibilities will depend the growth, development and progress of our Society and its usefulness in the community. This will result from a scientific standpoint in papers founded on clinical and pathologic research, and will promote and extend information upon all subjects relating to Child Welfare. In this way every physician interested in pediatrics will become familiar with child welfare problems, and the whole subject of child life in all its phases and circumstances.

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* President's address, before the Philadelphia Pediatric Society, January 12, 1915.

Heretofore the attitude of most physicians has been too individualistic. What we need in our present stage of progress is a broader outlook and more altruistic service. The conservation of the race is the one vital problem of society and we are coming to realize more and more that no individual consideration can be permitted to stand in the way of the best interests of the community. Public health has a prior claim to the rights of any individual, and the physician who has the true conception of his high calling, and is alive to the altruistic responsibilities of his profession, must place the welfare of the group above any personal interest.

E. P. Lyon,[2] in a recent article, ably voices this sentiment when he states: "Medicine is losing its individualism. You must become less and less the sellers of healing and more and more the captains of health." In speaking of preventive medicine he says: "Some physicians fail because they still take the narrow individualistic view of their work. They get the patient so close to their eyes that they cannot see the public. They see their trade, but fail to recognize their profession."

We as physicians must recognize that the time is fast approaching when the health of the community is going to be supervised by the State, in some such manner as education now is, and it behooves each of us for his own interest to keep pace with this new order. In the words of a recent Philadelphia writer:[3] "The handwriting has already appeared on the wall, and the shrewdest as well as the most public-spirited of the younger men are preparing themselves for the field of public health service, where the greatest usefulness is to be attained and the highest laurels to be won." The State has begun to view the individual from an economic standpoint, and to realize that money spent in various ways to keep the individual well, improve his environment and promote his development, means a corresponding decrease later in the cost of providing for defectives and delinquents.

There are many social agencies which are working along these broad lines for child welfare, with which every conscientious physician should be familiar and to which he should give his deepest interest and heartiest coöperation. I should like to call your attention to some of these activities, and show briefly their dependence upon the physician for direction and efficiency.

Prenatal Care.—It is hardly necessary to call your attention to the inter-relationship which should exist between the obstetrician, the expectant mother and the nurse. It is not within the province of this paper to discuss the difficulties which are encountered in attempting to secure the ideal results from such a relationship. I shall content myself with the statement that if we know what is best for our patient it is our duty to be satisfied with nothing short of its attainment. The dangers to the expectant mother during pregnancy, labor and the puerperium are so well known as to require no mention here.

An investigation[4] made in Philadelphia showed that in *1911* there were 39,975 babies born; of these, 2,131 were stillborn. The health officer of Washington, D. C.,[4] has stated that in *1911*, out of 957 deaths in the first year of life, 395, or about 40 per cent., occurred during the first month, one-sixth occurring on the first day. We are told by Dr. H. C. Carpenter that during the past five months 775 infants have died in Philadelphia from congenital diseases. This high mortality occurring during the first few weeks of life is due to hereditary weakness or disease, malformations, difficult or mismanaged childbirth, and septic infection, and many of these deaths could, without doubt, have been prevented by prenatal care.

It is known to most of you that many agencies in this and other cities are successfully carrying on a prenatal care work. This is accomplished by the routine visits of a specially qualified nurse to the home of the expectant mother. Through these visits she is enabled to give advice regarding hygiene, diet, exercise, sleep, the proper care of the breasts, to collect specimens of urine for examination, to take blood pressure readings, and note the presence of any symptoms suggesting danger to the mother or child. These findings are reported by the nurse to the physician engaged to attend the woman in her confinement. It is hardly necessary to add that it is very essential for the success of this work that the physician give his hearty coöperation, which entails a thorough and complete examination of his patient, including pelvic measurements, some time in the latter part of pregnancy. The visits of the nurse to the expectant mother afford a splendid opportunity for the encouragement of breast-feeding, which is acknowledged to be one of the greatest factors in the saving of infant life. There is here a broad field for nurses especially trained in this work as well as for the visiting nurse society, and the Board of Health nurses for patients of small means.

Health Center—Inspection Center—The Health Center is a form of activity comparatively new. It has a distinctive place, however, in the community not filled by any other agency. It came into being to fill a want created by the great numbers among the poor who, because of overcrowding and ignorance, require advice relating to health, hygiene and manner of living. It is the most intensive community service which is being rendered. The Health Center confines its work to a limited area, where the need is felt to be greatest, and this area is extended as the work progresses.

The Health Center commands the services of physicians, nurses, social workers, and enlists the coöperation of the Board of Health and various departments of the city government. It assists materially where possible to improve the home conditions of those under its care. Its function is primarily to keep the community well, never to treat the sick. When medical care is deemed necessary the Health Center advises where suitable treatment may be obtained, referring the patient to his own physician or to the appropriate dispensary or hospital. Prenatal care, as already described, is an important part of its work. In addition to these already mentioned, of great service, are the educational classes for mothers, and the "Little Mothers' Leagues."

One very important phase of the Health Center work is the reduction of infant mortality, and the service rendered the "under school age" child, who heretofore has received no definite attention. The value of this latter service is summed up by "Forsyth,"[5] who states: "Large numbers of children, although healthy in all respects at birth, become within five years the physically defective entrants whom the education authority is required at no small cost to restore as far as possible to their original state of health. Yet most of these cases are preventable, or, if taken in time, can be remedied more speedily and therefore more cheaply than if left to school age, by which time not a few will have received permanent damage, physical or mental. The problem of the defective child largely resolves itself into the problem of the 'under school age' child, and seems hardly likely to be solved by any scheme short of a national one, ensuring all children regular medical supervision from birth to school age. And this to be fully successful must run side by side with educational measures for instructing the mothers themselves who, from ignorance far more than from wilful neglect or even from indigence, are unable to safeguard their children's health."

The Baby Welfare Station—A Baby Welfare Station, or Baby Saving Station as it is sometimes called, is essentially a community agent, and is devoted to the needs of the neighborhood in which it is placed for the benefit only of those unable to employ a private physician. The need for such an activity is not questioned by any who are familiar with the subject. In New York City the infant mortality rate has been steadily reduced from 135.8 per 1,000 living births in 1910, to 94.6 in 1914. This has been accomplished through the admirable work of the Child Hygiene Bureau. It may be of interest to mention, however, that notwithstanding the lowering of the infant mortality there has been no change in the lowering of the infant death rate of the first few weeks of life, thus emphasizing the great importance and need of prenatal care as already discussed.

One phase of the work in New York comprises so-called Baby Welfare Stations, which now number about fifty-six, while in Philadelphia there are none under municipal control. The functions of a Baby Welfare Station are in many respects similar to those of the Health Center; its work, however, is less intensive, but includes a dispensary for sick babies and usually a milk station. Then, too, while the Health Center is concerned with the welfare of every member of the family under its care, the Baby Welfare Station is devoted almost exclusively to the care of the baby.

Home Care—In spite of the extensive and intensive work of all these social agencies, it is obvious that the great majority of children will not come under their influence, as they are designed primarily to help those who cannot afford the services of a private physician. While under school age, the child of well-to-do parents receives his medical attention from the family physician. On this physician, then, rests the responsibility of doing for his patient what the Health Center aims to do for the children of the poor. His interest should not be confined to the special ailment which he is called upon to treat, but he should make of each such occasion an opportunity to carefully examine the child, and give directions as to the hygiene, diet, clothing and every detail pertaining to the life and welfare of his small patient. His eye should be as quick to detect any physical or mental defect, which can be remedied in the very early years of childhood, as that of the school medical inspector, who will eventually discover and endeavor to correct the trouble, if the impairment has not already become permanent.

A long step in advance will have been taken when the physician succeeds in convincing parents that much of the sickness of childhood can be more easily prevented than cured.

If some such continuous and persistent effort to keep the children under their care in the best possible condition were maintained by social agencies and private physician alike, it might sometime become possible for the child to present upon admission to school, its life history with a complete record from birth.

School Life—"The health of the public in general and of school children in particular is the very core of the nation's life."[3]

Medical inspection of school children has already become a permanent addition to our civic government, and is so familiar to every one as to warrant little more than mention of the various opportunities for service which are extended to the school inspector and the trained nurse who assists him. Among these may be mentioned the correction of physical defects existing, the detection of contagious disease, expert examination to detect mental deficiency, placing in special classes poorly nourished and anemic children, placing in special classes defective and backward children, and to these have recently been added a course to pupils in the upper grades on the care of the baby.

Hospital Dispensary—The present-day hospital dispensary with which everyone is familiar is in a transitional stage. Older methods are giving place to newer ideals, and a broader policy is being pursued to fill the better understood needs of the community.

The work of the dispensary physician is being made more efficient and more permanent results attained by coöperation with the social service worker, and the development of the follow-up system. By these means the physician sees his patient more regularly and frequently and is able to keep in touch with home conditions and its environment.

It is hardly necessary to say that nothing short of the most thorough and conscientious examination and treatment on the part of the dispensary physician is consistent with his duty to his patient. He should take advantage of all the assistance the other departments of the hospital have to offer and accord the patient the most expert care available.

Hospital—The honor of being the visiting physician to any hospital should stimulate the recipient to the highest type of service to the institution and every patient who comes under his care. The modern hospital has come to realize that its medical staff is of great importance in helping to shape and direct the policies and aims of the institution, in order to attain a higher degree of efficiency and usefulness in the community. The conscientious visiting physician, therefore, must use every effort to make the institution which he serves a true Health Center to the community and use every opportunity which the hospital affords for educational purposes. He must be faithful and painstaking, seeing his patient frequently, and taking sufficient time for thorough examination and study. Anything short of this is unfair to the hospital, to the patient, valueless to the physician and ruinous to his reputation.

The Day Nursery—A recent study of the Day Nurseries in Philadelphia will undoubtedly result in higher standards as to construction and management. In the past, too little attention has been given to the developing and perfecting of these agencies, and to the general welfare of the children under their care.

Here again the influence and assistance of the progressive physician are invaluable. He stands in the same position to the children of the Day Nursery as the general practitioner to his private patient, and should give the same devoted care as already outlined, including regular examinations, careful attention to the correction of any mental or physical defect, and explicit directions concerning every detail of the child's life.

Institutional Care—The institutional care of children is on the threshold of many changes. Recent investigations of this subject prove that children, and particularly infants, do not thrive as well under institutional care as when boarded out in private families; but for the present at least such agencies are necessary as a temporary refuge until the child can be properly placed. During this period of institutional care the child should be given the most expert attention of which the physician is capable, and he should refuse to be connected with any institution which fails to correct existing evils, or make improvements which he deems necessary for the child's normal development. The opportunity of caring for homeless children does not carry with it the privilege of giving them any but the most expert care. Both the day nursery and the institution caring for children present splendid opportunities to the physician for thorough examination, and the early recognition and correction of mental and physical defects. Here again the prevention of disease and deformities, rather than their cure, illustrates the highest conception of the physician's function.

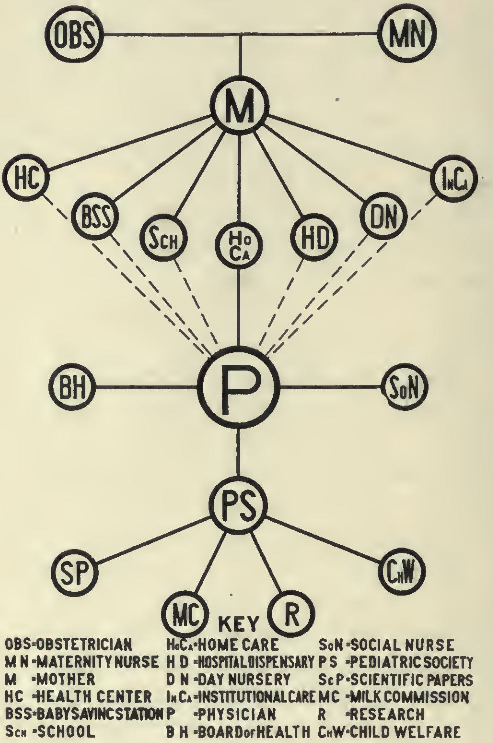
Board of Health—The relation of the Board of Health to the community is obviously too broad a subject to be treated at any length. A Board of Health is an essential part of the government of every city, and its importance cannot be overestimated. The broad field for service and the enormous responsibilities thrust upon it demand that the work be placed in competent hands. Here the physician stands out preëminently as the one best fitted by education and practical experience to cope with the great problems of public health.

The health officer of a city should be a physician with a broad vision and complete grasp of the subject of public health, schooled in matters pertaining to hygiene, sanitation and the control of contagious diseases. His associations and assistants should possess a similar equipment, and a determination to measure up to the highest standards in the particular field assigned them. A peculiar responsibility falls upon the "city physician," whose work among the poor and destitute of the city presents such a wide scope for fine and devoted service.

Conclusion—In a very hurried and inadequate way I have tried to touch upon the newer ideals of service which have pervaded the whole field of medicine and particularly that of pediatrics. The physician has become a great factor in the elimination of preventable disease by his work along educational lines. It is a vastly finer thing to *prevent* rather than to *cure* disease, to whose existence we give our tacit consent when we make no earnest effort to eradicate the causes. Individually each physician can do much, but in coöperation with all the social agencies working toward this higher ideal, his capacity for service is increased a hundred fold. My paper would fall far short of its intention if I failed to impress upon you the duty of the Pediatric Society to maintain leadership in all matters pertaining to problems of child life. A Pediatric Society should be the highest authority in all such matters, as the problems of child life in all its phases are essentially its business.

To this end the Society must encourage scientific papers which will add something new to existing knowledge; it must develop a deeper interest in pathologic and clinical research; it should originate and direct child welfare movements; these, together with the work of the Milk Commission, provide a broad scope for the activity of the Pediatric Society.

It is therefore unnecessary to emphasize the importance of active membership in such a society to any physician who numbers children among his patients.



The above chart is a suggestive representation of the inter-relationship which exists between the physician, his Pediatric Socety, and the child in the various environments in which it is found.

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MISCELLANY

STATEMENT BY THE MEDICAL MILK COMMISSION OF ESSEX COUNTY, NEW JERSEY, RELATIVE TO THE PROBLEM OF BOVINE TUBERCULOSIS

Following the statements by the Medical Milk Commission of Essex County, issued in November, 1914, and the temporary withdrawal of the certificate from the product known as certified milk, the Commission adopted several new rules with reference to the future veterinary supervision of the herd. These included the quarantine and careful segregation of all new cows, notwithstanding the test at the time of purchase and within three months a retest before they are used for the production of certified milk.

Soon after the general retest of the Fairfield Dairy herd in October, the Commission determined that as soon as it was expedient a third and crucial test should be applied. The Commission thereupon appointed a board of veterinary experts, consisting of Professor V. A. Moore, dean and director of the New York State Veterinary College, Cornell University; Professor Louis A. Klein, dean veterinary department, University of Pennsylvania, and Professor David S. White, dean veterinary department, Ohio State University.

This board was employed by the Commission to direct and conduct this third test and to determine the true status of tuberculin as a means of excluding infected cattle from certified milk herds, and to advise the Commission on its future course with reference to the control of bovine tuberculosis.

Letters were received which show that these gentlemen did not wish to give the time required for the work nor to leave their universities, but recognizing the importance of the situation met by the original Medical Milk Commission and through the urging of leaders in this pure milk movement throughout the United States, they consented to serve in order to rehabilitate this system of medical control of milk production and to restore public confidence in certified milk. Not a small factor in their decision was the fact that the problem involved the integrity of the system followed by many other Commissions elsewhere.

This work was begun on January 23d and completed on February 7th, the detailed report on which is submitted herewith.

The report on the investigation and retest, filed with the Commission by the experts, announces the fact that after an exacting examination of every animal on the plant and the employment of a double dose of tuberculin, the herd tested in October revealed a very small percentage of reactors; that the herd is now entirely free from reactors and in the judgment of the board practically free from tuberculosis.

At its meeting held February 11th, the Commission with unanimous consent restored the certificate to that portion of the milk product of this dairy which falls under its supervision, its contract and its new requirements.

The Commission wishes to acknowledge its indebtedness to the Government service at Washington for valuable assistance and for supplying the U. S. Government tuberculin with which to make this test.

It is still the desire of the Commission to extend the production and the use of the highest grade of milk, and while it is not the function of this body to impress dairymen into this work, the Commission respectfully offers its gratuitous service to any who will comply with its requirements.

By order of the Commission,
HENRY L. COIT, President.
FLOY MCEWEN, Secretary.

February 11, 1915

TO THE MEDICAL MILK COMMISSION OF ESSEX COUNTY,
NEWARK, NEW JERSEY.

Gentlemen:

We, the committee appointed by you to examine into the condition existing at the Fairfield Dairy, the milk from which has been certified by your Commission, respectfully submit the following report:—

In accordance with your instructions, we have made an investigation into the condition of the herd with reference to tuberculosis, have applied the tuberculin test, and have formulated recommendations which may serve for the future guidance of your Commission.

METHOD OF PROCEDURE

We arrived in Newark January 23, 1915, and were taken to the Fairfield Dairy Farm. At Mr. Stephen Francisco's residence we met in conference with Dr. Henry L. Coit, Dr. H. B.

Whitehorne, Dr. M. R. Whitenack, and Dr. George H. Cobb, of the Medical Milk Commission; Mr. C. H. Wells and Dr. James McDonough, of the Montclair Board of Health; Dr. Werner Runge, consulting veterinarian of the Commission; Mr. Stephen Francisco, Mr. Stephen J. Francisco and Mr. Wellington Francisco, of the Fairfield Dairy Company; and Dr. W. F. Harrison, veterinarian, of Bloomfield, N. J. During the conference statements concerning the herd were made by Drs. Coit, Whitehorne, Whitenack and Cobb; Mr. Wells, Dr. McDonough, Messrs. Francisco and Dr. Runge. After the conference the committee inspected the barns and cattle.

Records concerning the herd kept by Dr. Floy McEwen, secretary of the Medical Milk Commission, Dr. Runge, consulting veterinarian of the Fairfield Dairy Company, and Mr. Wells, of the Montclair Board of Health, were procured for the use of the committee.

The records show that it has been the practice to test cows to be added to the herd with tuberculin at the time of purchase and that only those animals which pass the test are added to the herd. A retest is made about six months later of all the cattle of the original shipment remaining in the herd.

The records, however, do not include those animals, if any, which reacted to tuberculin at the time of purchase and were therefore not shipped. The consulting veterinarian informed the committee that with the exception of three shipments (one each from Watertown, Liberty and Solon) the number of animals that reacted from among those tested at the time of purchase was small. In the exceptions mentioned the number was about 15 per cent.

At the first retest and subsequent tests the records show only those animals which did not react, which, coupled with the fact that the tag numbers uniformly disappear from the records, we take as an indication that the reacting animals were removed from the herd.

The records of the test made from October 16-29, 1914, contain the temperature records of all of the animals tested at that time. These tests include all the cattle on the farm except two shipments, totalling approximately 45 cows, which were subjected to the original test at the time of purchase too recently to be included in the October test. These cattle at the time of our examination were in barn No. 4.

It does not appear to have been the custom to make a test of the entire herd at intervals of about one year. As far as can be ascertained from the records the first tuberculin test of the entire herd (numbering 632 animals) was made October 16-29, 1914. At this test 191 (30.2 per cent.) were found to have reacted.

January 28-31, 1915, we, with the assistance of Dr. C. P. Fitch, assistant professor, Cornell University; Dr. V. G. Kimball, assistant professor, University of Pennsylvania, and Dr. J. N. Shoemaker, assistant professor, Ohio State University, tested with tuberculin 469 cattle stabled in four barns.

In making this test the following method of procedure was carried out:—

Four preliminary temperatures were taken, beginning at 2 P.M. and continuing at two-hour intervals. No animal which had a preliminary temperature of 103°F. or above was tested (with one exception).

The injection of tuberculin began at 9 P.M.

The unit dose of tuberculin injected was 4 c.c., or double its usual dose. The Bureau of Animal Industry tuberculin was used. Beginning six hours after injection the temperatures were taken and repeated every two hours thereafter up to and including the twentieth hour. If the temperature at the twentieth hour was higher than any previous temperature it was taken at two-hour intervals thereafter until it began to fall.

Close observation was made to detect any indication of an "organic reaction," such as chill, roughening of hair, dullness of eyes and refusal of food. These observations were carefully recorded. The animals tested were distributed among the four barns. The number in each, together with the result of the test, were as follows:—

In barn 1 there were 141 cows and bulls tested, including 4 cattle in an adjoining shed. Of these, 7 reacted and 4 (old Nos. 3232, 3287, 3102 and E7484) were held for retest because of a rise of temperature insufficient to constitute a reaction.

In barn 2 there were 86 cows tested. Of these, 3 reacted and 5 (old Nos. E1414, 3241, 1927, 3269 and 3349) were held for retest.

In barn 3 there were 160 cows tested. Of these, 21 reacted and 6 (old Nos. 3335, 2088, 2464, 3230, 3018 and 3346) were held for retest In addition to the 160 cows tested in this barn there were 3 (No. tag stall 65, 3362 and 3335) that had high preliminary temperatures and were not tested.

In barn 4 there were 82 cows and heifers tested including 3 cows in a nearby horse barn. Of these, 23 reacted and 5 (old Nos. 21, 3401, 3410, 3395 and 2389) were held for retest. In addition there were 2 (old Nos. 6 and 7) not tested because of high preliminary temperatures. In this barn there were 45 cattle remaining from two shipments purchased September 8 and October 3, 1914, respectively, at Watertown, N. Y. These shipments contained originally 54 animals. These 45 animals were not included in the October, 1914, test. For the purpose of this test the other 37 cattle were placed temporarily in the opposite end of this barn. Of the 45 cows in the two shipments from Watertown 23 reacted. The other 37 cattle consisted of 2 from Solon, O.; 11 from Watertown, N. Y.; 3 of unknown origin, and 21 home-raised animals. Some of the New York and Ohio cattle had been in the herd from one to three years. Two of the 11 cows from Watertown reacted; 1 (old No. 21) of the home-raised animals was held for retest and 2 were not tested because of high preliminary temperatures.

When the cattle in the September and October shipments from Watertown arrived at the farm they were placed in barn No. 4 until released by the veterinary inspector of the State Tuberculosis Commission for this district. Then, about one or two weeks after their arrival, several of them were placed in barn No. 3, where they remained until the October tests were completed. About November 1st these cows were returned to barn No. 4, where they were kept isolated with the balance of the shipments, as noted. These shipments were not tested in October because they had been injected with tuberculin less than two months.

Excluding the 45 Watertown cows and the 21 home-raised heifers there were 403 animals in our test that were tested in 1914. Of this number 31 (7.3 per cent.) reacted. Ten of these reactors, those from barns 1 and 2, were slaughtered and examined by us in company with Dr. McDonough on February 1st. In all of these animals the lesions were relatively slight and usually calcified. In 2 cases the lesions in the lungs were of such a nature that these cows may have been "spreaders." The other reactors were separated from the non-reactors on February 1st.

Thirty-five of these were slaughtered on February 7th and the remainder were at the abattoir for slaughter on February 8th.

Arrangements were made with Dr. Coit for the cleaning and disinfection of the barns in which reacting cattle were found. The most efficient method of cleaning and disinfecting these barns seemed to be to brush and scrape the ceilings, walls and floors, to scrub the walls and floors with a hot 2 per cent. soda solution and then to spray the ceilings, walls and floors with a 5 per cent. solution of carbolic acid. This is practically the method that we are informed has been followed heretofore.

SOURCE OF INFECTION

The records show that it has been the practice of the Fairfield Dairy Company to purchase usually carload lots of new cows from dealers. In order to prevent the introduction of tuberculosis, all cows were tested with tuberculin, as noted, at the time of purchase, and only those that passed the test were shipped to the farm. It has also been the practice to dispose of all cows which for any reason (failing lactation, injuries, disease, etc.), become inefficient. Until recently it has not been the practice to breed and raise their own cows.

As noted, the cows which are purchased are from herds that have been assembled by dealers. For well recognized reasons it is safe to assume that cattle assembled in this way will have among them a greater or less number of individuals from tuberculous herds.

The only method of protection which can be used against the introduction of tuberculous animals when purchased from such herds is the tuberculin test.

While a few years ago the tuberculin test was considered adequate in this regard later experience has demonstrated that this alone is not sufficient protection. It is now a well-established fact that when an animal gives a typical reaction to tuberculin it will be found to be tuberculous. On the other hand, ample evidence is available to show that a percentage of tuberculosis infected animals will, under certain conditions, fail to react to the test. It is now generally recognized that cattle which have been infected with tuberculosis may not react to the test under the following conditions: (1) During the period of incubation; (2) when the progress of the disease has become temporarily or permanently arrested; (3) when the disease is far advanced; (4) in many cases where tuberculin has been injected a short time prior to a test. Repeated injections of tuberculin made at short intervals may inhibit for variable periods of time the specific temperature reaction.

THE WATERTOWN FACTOR

That it is possible for cattle to pass the tuberculin test and still be the means of carrying infection into a herd is shown by the history of the cattle purchased at Watertown. The shipments of September 8th and October 3d from that point contained 54 cattle which passed the tuberculin test at the time of purchase. Forty-five of these remained on the farm and were retested by us on January 30th and 31st and 23 (51 per cent.) reacted. With the exception of the few cows which were in barn No. 3 for several days, none of these cattle had been in contact with the other animals in the herd from the time of their arrival until our test.

Again, on May 1st, 29 cows passed the tuberculin test at Watertown and were shipped to the farm. Twenty-four of these were in the October test and 21 (87.5 per cent.) reacted. The postmortem examination of the reactors disclosed lesions in most of them which indicated that the disease was present at the time of purchase. In 4 the disease was generalized and the carcasses were condemned; in 16 the lesions were calcified.

A study of the reactions in the October test shows that of the cattle remaining in the herd out of earlier shipments from Watertown, a greater percentage reacted than of the cattle remaining out of shipments from other points. The appended table shows the number of cattle out of these earlier shipments tested in October and the number and percentage which reacted:

Date of Shipment from Watertown	No. of animals in shipment in herd Oct., 1914	No. that reacted Oct., 1914	Percentage of reactors
May 30, 1913	7	4	57 %
July 13, 1913	16	9	56.2 %
Aug. 17, 1913	25	16	64 %
Aug. 24, 1913	3	1	33.33%
Aug. 29, 1913	11	4	36.4 %
Sept. 13, 1913	14	3	21 %
Oct. 11, 1913	35	18	51.4 %

Although there was an opportunity for these cattle to be infected after their introduction into the herd, the greater percentage of reactors among them would seem to indicate that some of them at least were infected at the time of purchase.

PREVIOUS TESTS AND METHODS

As to the character of the tuberculin tests in these cases, the records show that the tests made at the point of shipment were complete and further that the subsequent tests in which the reactions occurred, except the test made by us, were conducted in exactly the same manner by the same veterinarian and with tuberculin from the same laboratory. The usual pre- and post-injection temperatures were taken and in many instances they exceeded in number those required by the law governing the tuberculin test in the State of New Jersey.

The method of handling the herd has been such as to afford an opportunity for any infected cows introduced to spread the infection. It has been the custom to place new cows in barn No. 4 or barn No. 3 as soon as they came into milk, and later, when they were in first-class order and in good milking condition, to move them to barn No. 1 or No. 2. The object of this plan was to put the best cows in barns 1 and 2, from which the certified milk was obtained. While the purpose was a laudable one, the plan cannot be commended from a sanitary point of view. The segregation of new cows until they had passed a retest and less transferring of cows from one stall to another would have the effect of preventing the spread of infection. A retest of all new cattle with a double dose of tuberculin two to three months after their introduction into the herd and a test of the entire herd at intervals of approximately one year would also tend to minimize the infection in the herd.

CONCLUSIONS

From the information at hand, it is our opinion that the source of infection and the extent of the disease found in the October tests were due to the introduction of infected cattle, to the failure to segregate and to more promptly retest new cows, to the lack of an annual test of the entire herd, and to the shifting of animals from one barn to another. We regard the herd at the present time as practically free from tuberculosis, and we believe that your Commission need not withhold certification on account of tuberculosis.

RECOMMENDATIONS

We recommend:—

(1) That the Fairfield Dairy Company extend as rapidly as possible the plan which they have recently instituted of raising cows to replenish the herd, and that the practice of purchasing cows for the Dairy be discontinued as soon as possible.

(2) That until sufficient cows can be raised upon the farm extreme care be exercised in purchasing new cows. By "extreme care" we mean that in so far as is possible cows be purchased from herds that are free from tuberculosis, and that the purchase of cows from miscellaneous lots of cattle assembled by dealers be discontinued.

(3) That all animals not obtained from tuberculosis-free herds be required to pass a tuberculin test before purchase and that they be segregated from the herd until they have passed a retest, which should be made two to three months after their arrival at the farm, a double dose of tuberculin being used.

(4) That a test of the entire herd be made regularly at intervals of approximately one year.

(5) That the regulations of the United States Bureau of Animal Industry be followed in making tests and retests.

(6) That a report of all tests and retests, including reactors as well as non-reactors, be filed with the Secretary of the Medical Milk Commission.

(7) That the herd and dairy farm be regularly inspected by the veterinarian of the Commission at intervals of approximately one month, and that a report of each inspection be made in writing to the Secretary of the Commission.

(8) That a veterinarian be added to the membership of the Medical Milk Commission.

In closing, we wish to express our appreciation of the efforts which have been made by all persons concerned to place in our possession records and information pertaining to the subject of our examination. The temperature records of the tuberculin tests made by us on January 28th, 29th, 30th and 31st are submitted herewith.

Very respectfully,

V. A. MOORE,
Dean and Director, N. Y. State Veterinary
College at Cornell University.

LOUIS A. KLEIN,
Dean, School of Veterinary Medicine at
the University of Pennsylvania.

DAVID S. WHITE,
Dean, College of Veterinary Medicine,
Ohio State University.

Newark, N. J., February 7, 1915.

SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS

Stated Meeting, Held January 14, 1915

WALTER LESTER CARR, M.D., CHAIRMAN

REPORT OF 4 CASES OF HEMORRHAGIC DISEASE IN THE NEWBORN TREATED BY HORSE SERUM

DR. A. HYMANSON stated that various hemorrhages were responsible for a great part of the high death rate among the newly born. Infection, syphilis, hemophilia and mechanical causes attendant upon labor played an important rôle in the etiology of hemorrhagic diseases. It seemed that nothing definite was as yet known about melena neonatorum, but the rapidity of the hemorrhage and the resulting collapse compelled prompt action. The treatment was directed to checking the bleeding, maintaining the strength of the child by replacing lost fluid, to promoting coagulation of the blood and counteracting sepsis. The drugs that had been used were adrenalin, calcium and gelatin, the latter on account of the calcium it contained, but blood therapy was the agency most generally used in the endeavor to control these hemorrhages.

Although they had had favorable reports from abroad concerning the use of calcium and particularly gelatin, still it was well known that there was no lack of calcium in melena neonatorum. remarkable cures had of late been obtained in all hemorrhagic conditions by direct blood transfusion, subcutaneous injection of human blood, human blood serum, horse and rabbit serum. Rabbit serum was used because it was easily obtained fresh.

Blood transfusion was quite a difficult operation, as the infant's blood vessels were so small. It was also frequently difficult to get a donor; the mother was too weak to undergo the operation and could not spare the blood; the father might be an ideal donor, but was not always at hand and not always willing to give the blood. It was not so easy to obtain a healthy stranger at the moment, one whose blood would not cause hemolysis. The expense was also an item.

Subcutaneous injection of human blood or blood serum was administered more easily, but it was difficult to obtain 40 to 50 c.c. of serum or 120 to 150 c.c. of blood, although in maternity hospitals, blood or blood serum could be obtained from the placenta.

Fresh animal serum, just as human serum, contained all the ferments of the blood and acted by its nutritive and bactericidal power; it also hastened coagulation. Hence it had been found very useful in hemorrhages of the newly born. The author had used horse serum in 4 cases of melena neonatorum, 3 of which recovered, while the fourth died.

CASE I. This patient was a male child, eight days old, whose family history was negative. The mother's urine contained traces of albumin and her blood showed a marked polycythemica. The coagulation time was seven and one-half minutes. The Wassermann reaction was negative. The child was apparently well until the fifth day, when bleeding began from the navel and occasional purpuric spots appeared on the lower extremities. The bleeding continued on the sixth and seventh days. Calcium lactate was administered without any improvement. On the eighth day the infant vomited a great deal of blood and had several profuse hemorrhages from the nose, mouth and bowels; there were also subcutaneous hemorrhages, some the size of a quarter of a dollar, on both sides of the thorax, and on the back and lower extremities. By evening of this day the baby was in a moribund condition, with a temperature of 97½°F. and the pulse could not be counted. The coagulation time of the infant's blood was eleven minutes. Twelve c.c. of normal horse serum was injected subcutaneously. By the following morning there was some improvement, but the bleeding from the rectum continued. A second injection of 12 c.c. of horse serum was then administered and in the evening another injection of 14 c.c., making in all 38 c.c. On the tenth day the bleeding stopped entirely and the child's temperature became normal. He gradually returned to perfect health, which he had retained ever since.

CASE II. This baby was a female child, born on September 10, 1914, of healthy parents, at full term. The labor was normal. Profuse bleeding from the mouth and rectum began on the second day. The coagulation time of the blood was about twelve minutes. The child's temperature was 97.6°F. Fifteen c.c. of normal horse serum was injected subcutaneously. On the third day the bleeding from the rectum still continued and the baby looked very weak. Another injection of 12 c.c. of horse serum was administered and within eight hours the bleeding stopped completely. On the following day the stools were normal. The baby rallied slowly and was discharged on the thirteenth day in a normal condition.

Case III. This patient was a female child, the second, born at full term. The labor was troublesome on account of placenta previa marginalis. The family history was negative.

On the fourth day the baby had about five hemorrhages from the rectum and vomited a small amount of blood. She was given 15 c.c. of normal horse serum. On the fifth day, the bleeding from the rectum still continued, but not so severely. Another dose of horse serum (15 c.c.) was injected and the bleeding stopped completely. This child was also discharged in good health on the thirteenth day.

Case IV. This patient was a male child, with a negative family history. Labor had been protracted and the baby was born asphyxiated. He did well until the fourth day, when his temperature rose to 101½°F., and later in the day he passed much blood from his bowels and vomited blood. Two grains of calcium lactate were given every two hours without effect. An injection of 12 c.c. of horse serum was then administered. The bleeding, however, continued, and by the following morning the child was in a precarious condition. An injection of 12 c.c. of the mother's blood was then injected into the infant's back. The infant did not respond to the treatment, and died that evening.

These cases all occurred in the Jewish Maternity Hospital. The horse serum was furnished by the Department of Health.

In closing, the author said he wished to add a word about anaphylaxis. The use of horse serum as a media for the various antitoxins had shown conclusively that the dangers of serum sickness and death had been greatly exaggerated. Serum sickness, as a rule, was a very mild affection, lasting only a few days. Serum death was a rare occurrence. Dr. Probasco (New York State Journal of Medicine, January, 1912) claimed that there was only one death in 25,000 injections of diphtheria antitoxin. In some cases in which death was supposed to be due to antitoxin autopsy had revealed a status lymphaticus before unsuspected. It had further been shown that nearly all deaths from antitoxin occurred in patients during adolescence or in asthmatic adults.

The author concluded that (1) the coagulation time of the blood was somewhat delayed in the conditions under consideration; (2) as there was always difficulty in obtaining human blood or fresh blood serum, fresh horse or rabbit serum would serve the purpose almost as well; (3) in the newly born infant, where the bleeding was not spurious, the horse serum should be administered early and repeatedly until the bleeding ceased; (4) the injurious effect that was caused by foreign serum had been greatly exaggerated.

DR. HENRY DWIGHT CHAPIN said that in 2 cases of hemorrhage in the newborn that had come under his observation the horse serum had been tried but had not been effective and they had been compelled to fall back on human blood serum.

Dr. Chapin asked Dr. Hymanson if he had considered giving diphtheria antitoxin as a means of administering the horse serum, and if he had used the human blood serum, and, if so, with what success.

DR. L. E. LA FÉTRA said that it was well known that the use of blood serum would check most hemorrhages of the class under discussion, but the use of whole blood as proposed by Schloss is much simpler. By Lindemann's method it was a very simple matter to withdraw 10, 20 or 30 c.c. of blood from the mother or father and inject it into the muscles of the back of the baby. By this method one did not have to wait, as was necessary when blood serum was used. Using whole blood he had been successful in about three-fourths of the cases; the success of the procedure was dependent on the etiology of the hemorrhage; hemorrhage due to general sepsis was not so amenable to treatment as when due to some other causes. In his opinion this method of Dr. Schloss was the best and quickest one available for this purpose at the present time.

DR. FENTON B. TURCK said he would like to say something on the experimental side of this subject which had a very marked bearing on what the essayist had presented. He had been making comparative tests of the intestinal bacteria on hemologous sera and had found that in young children bacterial migration occurred in the same manner as had been observed in experiments on young animals. The bacteria passed from the intestines very readily into the submucous tissue of the intestinal wall along the entire alimentary tract. The bacteria passed between the cells at the base of the villi, crossing the muscularis mucosa into the submucous areolar tissue, the "zona transformans," and were here destroyed. The antiferment in the serum was found to be reduced by this process. Previously they had found that the administration of chloroform reduced the antiferments in the blood, which was the same phenomenon which they now found occurred when the intestinal bacteria entered the submucous tissue and came into contact with the sera. It was found that when intestinal bacteria (B. coli) were fed to pregnant animals the bacteria would pass into the fetus and cause reduction of the antiferments, resulting in premature births, with hemorrhages and death of the newborn. The study of these experiments gave some suggestion as to treatment. When there was a reduction of the antiferments in the blood it was unnecessary to theorize about the absorption of toxins, for it was not shown that toxins were formed. The rapidity of destructive power was the result of the reduction of the antiferments permitting destruction by autolysis to take place. This phenomenon could be demonstrated *in vitro* as *in vivo*. The experiments undertaken in the production of hemorrhagic diseases were important and seemed to prove the value of supplying the deficiency of the antiferment in the sera by the addition of fresh blood. To the specialists in children's diseases there was an exceptional opportunity of making observations in these cases that were even better than animal experiments and some of the points had been well shown tonight.

Dr. Abraham Hymanson, in closing the discussion, said that, in reference to Dr. Chapin's remarks as to the use of diphtheria antitoxin in these hemorrhagic conditions, theoretically it would amount to the same thing whether they used the diphtheria antitoxin or simply the serum; the diphtheria antitoxin also contained the antibodies in addition to the other active elements of the serum and these ought not to hurt the baby.

As to what Dr. La Fétra had said as to the advantages of giving fresh human blood by the method of Dr. Schloss, he agreed that this might be better, but the trouble was that one could not always get a suitable donor in a brief space of time. As an instance of the difficulty of getting a donor, Dr. Hymanson related how one father had refused, saying he had to work fifteen hours a day and needed all his blood; this father had said, "Just look at me and see how pale I am." He had used the Board of Health serum and it had certainly worked marvellously well in his experience, though the number of cases that he had treated thus far was not very great.

As to the experimental part, he was not prepared to speak of that, but he was glad to know that this experimental work furnished some justification for the clinical results that had been obtained.

As to the matter of the placental serum, that could be used with ease in maternity hospitals by allowing the blood from the cord to run into sterile flasks, centrifuging and sealing. (A few drops of chloroform were used as a protecting layer.) Dr. Franz of Graz claimed that this could be kept as long as four months, but here one must have the Wassermann test to exclude syphilis.

A STUDY OF CERTAIN ASPECTS OF EPILEPSY COMPARED WITH THE EMOTIONAL LIFE AND IMPULSIVE MOVEMENTS OF THE INFANT

Dr. L. Pierce Clark stated that in previous studies of the epileptic constitution and in a psychological study of the meaning of the fit in epilepsy, it had been shown that the fit was a libidinous outlet for the infantile unconscious. The loss of consciousness was thus shown to be due to the insistent demand for expression of the unconscious, transferring the older conception from a negative postulate to a positive dynamic one. In its simplest and crudest form the nucleus of the unconscious striving was a desire on the part of the individual epileptic, not only to return to a state of infancy with the parent, but it really contained a motive for the epileptic to gain the life before birth as symbolized in the idea of life within the mother. In a measure this hypothesis supported by clinical observations seemed to be a sufficient psychological explanation of the fit so far as loss of consciousness was concerned, which was, after all, the real nucleus of the epileptic attack.

However, other questions arose for solution, one of the more immediate being an interpretation of the convulsive movements of the seizure. An examination of the intra- and extrauterine life of the child for the physical correlates of the convulsive spasms of the fit showed a very close parallel of movements at that period which, when under certain states of excitation, produced acts that were point to point identical to those seen in grand mal epilepsy. Probably all the convulsive movements in all the varied types of epileptic fits, from the most purposeful and apparently ideational or voluntary seen in the slightest grades of seizures, were drawn from the different developmental levels of child activities.

As was well known, the whole behavior of the nursling was determined insensibly by feelings of pleasure and those of discomfort; the latter, of course, far outweighing the former and diminishing very rapidly in the normal child after the first few months. The intensive longing of the child or the supersensitive epileptic to return to its former state of warmth and protection must be very great. The hampering and unpleasant influence of clothing, forcing as it did stereotyped positions, must be alike unpleasant to the child and the epileptic. The latter show their desire to free the person of clothing in the unconscious and automatic phases of the disease. The attempt to disrobe in the post-convulsive state of epilepsy was common. The same principle undoubtedly caused the instinctive urge in which in the automatic state the epileptic often wandered from his usual abode.

The author devoted considerable time to description of the epileptic cry and the moaning and groaning that accompanied the after state of the fit. This latter seemed to be quite in the realm of consciousness, but not so the initial epileptic cry; the cry of protest, the corrugated brow and screwed-up face. These found a parallel in the infant reacting most keenly to a strong emotion of displeasure. Most observers had agreed that the cry must be more than a mere mechanical expulsion of expiratory air from the thorax as a sequence of tonic spasm. The combined pleasure-displeasure cry of the infant was not very dissimilar to the epileptic cry, when one allowed for the structural difference of the organs involved in the adult from that of the child. Almost invariably one found this peculiar cry in infants associated with tonic-clonic movements of the arms and legs, and Dr. Clark believed that the newer interpretations on the basis of a displeasure-pleasure hypothesis would throw a flood of light on both processes in the infant and in the epileptic attack initiated by this peculiar cry.

The author then traced the analogy of certain movements in the epileptic with those of displeasure movements of the infant, such as deflection of the head to one side, a turning away movement, a drawing of the mouth to one side and then upward and backward, the quadrangular or squarely opened mouth, which

Darwin dwelt upon as an extreme expression of childish rage. It was interesting to note the *tedium vitæ* in the infant and the epileptic alike; the lack luster eye, indolent movements, cessation of spontaneous interest, a falling of the countenance and a paler complexion; all such in the epileptic have been long considered as heralds of a grand mal attack. The great importance of a large amount of sleep in the epileptic was comparable with that required by infants. Interruptions of sleep in infants, as well as in epileptics during the state after attacks were alike disastrous to well-being or even good temper. The impulsive and incoördinate movements of infancy during sleep and during fetal life had a parallel in the adult in whom such bizarre movements were sometimes seen during sleep and particularly in the epileptic. The infantile poses and postures assumed by epileptics during sleep should be studied more carefully, as they furnished an illuminating side light upon the somatic and psychic infantilism of the epileptic. They did not know how these impulsive movements were incited, but their number was not great and might be schematized as those of outstretching and bending of the arms and legs of the newly born. The movements were sometimes so quick as to resemble the cloni of a fit; or they might be slow, then fast, and finally end in cloni, or they might be sinuous. A detailed study of all these and other movements of the infant suggested many of the striking impressions one gained in observing the convulsion of epileptics. Some of the depressors of these impulsive movements were deep, quiet sleep and satiation by food; duplication of the intrauterine state by the warm bath, on the other hand, encouraged them. It was striking that both the infant and the epileptic were little fatigued by the most intense and persistent impulsions, which spoke strongly for the unconscious motivation in both their activities.

In conclusion, the author submitted that they were justified in considering that the essential nucleus of the epileptic fit was a libidinous one; that it consisted in an infantile unconscious striving of displeasure-pleasure pursuit, ending in the final goal of an intrauterine life, attended by a loss of consciousness and a convulsion; that the convulsion was made up of and flowed out of the general libido striving of the fetal and infantile tissues as expressed through the lower spinal centers, in inducing simple and crude impulsive movements; that a study of the degree of development of unconscious infantile striving in the psychosexual sphere of the libido, the desire for the fetal intrauterine state of *allmacht,* was paralleled by the kind and character of impulsive movements found in this infantile period of neuromuscular development. Therefore the two main settings in the epileptic fit—unconsciousness and convulsion—were psychical and physical correlated; lastly, that epilepsy in its essential pathogenesis was an error or arrest in this fundamental elaboration or development of the psychosexual libido.

The essential pathogenesis of the disorder was still to be attacked. Whether the latter rested upon an inheritance of certain psychic traits alone or there were certain somatic structural anomalies which did not permit proper psychosexual development into normal adult life one could not say, but the author believed that such studies as he had presented here and were elsewhere reported narrowed the gap between such causes and their psychophysical expression in epilepsy, and, finally, such observations must be of the greatest aid in classifying the recoverable epileptics from the irrecoverable ones. It also pointed the way by which therapeutics might be advanced along the broadest biological lines of educational and moral treatment.

Dr. John T. MacCurdy, discussing Dr. Clark's paper, said that the underlying wish in the epileptic to return to a state of rest equivalent to that which the individual enjoyed in fetal life might seem a bizarre conception, but from his experience and from that of others with the insane it had to be regarded as a frequent type of unconscious wish that often came to open expression in psychoses. From that standpoint, therefore, he felt fully in accord with Dr. Clark. Dr. MacCurdy then spoke of the importance of the comparison which Dr. Clark had made between the suckling and the epileptic convulsive movements. On the basis of this identity he outlined a possible physiological theory for the origin of the convulsion, on the supposition that the mere loss of conscious control might set all the voluntary muscles into incoördinate motion.

Dr. J. Victor Haberman said that it seemed to him that the logic of Dr. Clark's paper was also unconscious. If the initial cry of the epileptic could be sufficiently explained by the sudden contraction of the thorax forcibly expelling the air through the larynx, why should one not accept this explanation instead of a far less logical one? He had noticed that in all their writings the Freudians gave no proof of their theories; they assumed certain things, left it at that, and then asked others to accept their opinion. Dr. Haberman asked whether the epileptic voice (described by Dr. Clark some years ago) was also a cry of the libido, also whether the convulsions in renal disease and in brain tumor were likewise expressions of the libido? How did Dr. Clark explain the fact that in many cases of epilepsy one found actual pathological conditions? Indeed, some believed, and it had even been expressed by the Freudists, that all idiopathic epilepsy was due to a pathological (in other words, organic) condition of the brain. How did Dr. Clark correlate these facts?

Dr. Israel Strauss said he rarely spoke or discussed a paper dealing with a subject treated from the Freudian standpoint, because it was impossible to influence any one who had taken that position. He had very much sympathy with Freud's theories. but he had always thought that the psychoanalysis of Freud applied to neuroses; and epilepsy was not a neurosis. A study of the brains of epileptics had shown many lesions, and Dr. Clark himself had described changes in the ganglion cells in epilepsy, and so it seemed that to look upon this disease as a neurosis one would have to revise his conception of the pathology relating to it.

Dr. L. Pierce Clark said he regretted the facetious element in the discussion. It was quite true that the logic and the line of reasoning in determining a psychological basis for unconsciousness must entirely concern the unconscious, and if the logic and the motive of the mechanism were in accord so much the better. The fact that the epileptic cry was not satisfactorily explained by any simple mechanical principle, and was so stated in any number of text-books on epilepsy, urged them toward finding some other elements as well as the psychical to account for it and thus make clearer this one phenomenon which was so peculiarly unique to the epileptic state. It could not be reproduced by imitation, nor was it present in any other phase of disease. They now had a very good explanation of the voice sign. The essential defect in epilepsy was one of the primary instincts. That being the case, they would expect the condition to show in later life as an affective emotional defect in the epileptic mentality, which was the case. If this were granted, they would quite expect that there would be an essential incompleteness of emotional expression in epilepsy. Therefore, they found that as a class epileptics were neither good musicians nor had beautiful voices. Of course it was absurd to push the epileptic mechanism to explain all convulsions occurring in other disorders purely as symptoms such as those occurring in renal disease or brain tumor. The equal presence and absence of any histological lesion in the epileptic brain would make one, on the face of that statement, throw aside any lesion as being essentially a causative factor. They must look upon such brain lesions when present as a result of the disorder and not its cause. While many had observed a fairly close relation between certain diseases of the motor cortex and the epileptic convulsion, no one had been so bold as to push the law of psychophysical parallelism to the point of making such lesions in the cortex the cause of loss of consciousness as seen in the epileptic attack. Inasmuch as the latter symptom was the one essential factor in epilepsy, it was necessary for them to bring into play a defect in some fundamental principle in life which should be as broadly significant in motive as that which underlay life itself. This was what the speaker had attempted to do. In point of fact, one might say that all the organic lesions in the epileptic brain were but precipitating factors in lowering mental tension or continuing the same, thus permitting certain morbid phenomena in the instinctive life to have their play as shown in the fit. While the formulation of the principles which he had brought forward might undergo more or less modification, it was his belief that he had outlined a rational and fundamental plan for understanding both the loss of consciousness and the convulsions of epilepsy. As to what might be the precipitating causes of the underlying defect of the epileptic constitution which permitted individuals to have seizures was still a question demanding solution.

THE PRESENT CONCEPTION OF CHOREA

Dr. Israel Strauss read this paper, which he prefaced by referring to the many different hypotheses that had been advanced to account for chorea. He stated that it had been attributed to a hereditary tendency, to neuropathic taint, fright and excitement. The more probable theory was that these were but predisposing causes, the disease itself being of infectious origin. The purpose of his paper was simply to weigh and discuss these different views. The relation of rheumatism to chorea had been noted and the suggestion had been advanced that they might be due to the same agent, or that the one stood in a causative relation to the other. Possibly chorea was a metarheumatic condition, just as tabes and paresis were parasyphilitic affections. Authorities were by no means in accord with regard to the embolic theory. One authority stated that 56 out of every 63 cases of chorea gave a history of rheumatism, and Thayer stated that 21.6 per cent. of choreics had had rheumatism. To settle this question satisfactorily, the etiology would have to be discovered in both conditions. There was evidence of the presence of the streptococcus in most cases of polyarthritis. Diplococci and staphylococcus pyogenes aureus had been found in choreics and much biological work had been done by the different methods, complement fixation, aerobic, and anaerobic methods, and the results differed widely. Chorea had been known to follow typhoid fever, malnutrition, syphilis, the abuse of alcohol, etc. It was a disease of early life and occurred most frequently between the ages of six and fifteen years. It was more apt to occur in wet, cold seasons. It was frequently febrile in the early stages and gave evidence of endocarditis. The fatal cases showed the rugæ of endocarditis. What influence the cortex exerted was unknown. In fatal cases the brain lesions were those of acute encephalitis, and this brought up the question to what extent such lesions were present in the ordinary cases that went on to recovery. The probability was that this would never be known until some case of moderate chorea died suddenly and an autopsy was obtained. In the present state of their knowledge the only conclusion that was justifiable was that chorea was probably of infectious origin, but the data at present was altogether insufficient to decide the nature of the infection.

Dr. L. E. La Fétra said he had come expecting a very different expression of opinion on the subject of chorea and was prepared to disagree, but, on the contrary, he quite agreed with what he had heard. It seemed that chorea must be considered as closely related to polyarthritis and must be considered as due to some kind of bacterial infection in the vast majority of cases.

There were two points to which he wished to call attention: First, in Bellevue Hospital they had made a number of studies of the blood in chorea, and in two of these the streptococcus viridans was found in the blood. Complement deviation tests by Dr. Hoobler were found positive in 2 other cases. In the second place, it had been observed that children who had just recovered from polyarthritis or acute endocarditis frequently developed chorea while still in bed. When the influences that were generally given as exciting causes of chorea were absent, when there was no fright, no malnutrition, no excitement, nothing in the way of nervous shock to account for the development of the chorea, one might feel quite positive that in the majority of cases chorea was an infectious disease. On the other hand, there were some cases that followed so quickly upon fright and nervous shock that it would seem probable that some cases had a different basis.

Dr. Haberman said that no mention had been made of psychic chorea. He recalled a striking case which came to Professor Starr's clinic some years ago. This patient had such an apparently typical chorea that Dr. Starr was about to show her to the students. As she was complaining of a headache she was taken aside for a moment and treated with hypnosis. On awakening not only had the headache disappeared, but the entire chorea. For several weeks after this he had treated a large number of choreics coming to the clinic psychically and found that in some the chorea disappeared at once; in others after a few treatments. These could not have been cases of rheumatic chorea. After studying a still larger series he had concluded that psychic chorea was not uncommon and that many, if not most, of the cases lasting over three months were of this nature. Furthermore, many of the recurring attacks in neurotic children who had had real chorea in the beginning were psychogenic. The child was on the watch for a new attack, and so got it. These cases were all strongly amenable to psychic therapy. There was no way of differentiating the psychogenic cases from the others save by the result of treatment. Another series of cases was due to congenital syphilis. Millian in France and Nonne in Germany had called attention to these cases. The former had found lues so frequently in the heredity of chorea that he thought chorea must be a manifestation of congenital lues. Few, however, had accepted his view. Nevertheless there were cases certainly due to this factor. Dr. Haberman said he had recently treated a child for chorea who had had the disease for three years. The mother was being treated for syphilis, yet none of the physicians seeing her thought of associating the child's chorea with congenital lues. A positive Wassermann was found. Antiluetic treatment was instituted and the chorea cured in a short time.

Dr. Henry Dwight Chapin said that the relationship of rheumatism, endocarditis and chorea had been studied many years ago and observers had come to the conclusion that they manifested the same underlying pathological condition, and it really seemed that up to the present time they had not got much beyond this view. It seemed that undoubtedly they were all of an infectious origin. Where one of the three conditions was found one was very liable to find the others.

Dr. Henry Koplik called attention to the importance of seeing these cases of chorea through years, for it might be said of chorea, "Once a choreic always a choreic." When one watched the heart involvement becoming gradually worse and worse it led to but one conclusion, and that was that the poison that was causing the chorea was producing the endocarditis. The way in which the term rheumatism was used today was most unfortunate; it was very much like the former use of the term "malaria." It was probable that the poison causing polyarthritis was closely allied to the one that produced endocarditis and chorea. The question was whether the habit movements were the result of, or continuance of, a condition produced by infection. Dr. Haberman spoke of the cases controlled by hypnotism; these could not be due to the same etiology as that associated with the cases supposed to be due to infection. As to the finding of an organism, in many cases where the cultures of chorea had been examined the technique was faulty, in others a mixed infection had been found, and he believed that in the future something different from the organisms to which the condition had been attributed would be found. He had had several cases examined and nothing was found. It was quite possible that the streptococcus might accompany the true organism. The Klebs-Loeffler bacillus and the streptococcus were frequently found together, but this did not mean that the streptococcus was the cause of the diphtheria, and likewise it would probably be found that the streptococcus viridans was not the real cause of the chorea.

Dr. Ellas H. Bartley, of Brooklyn, said they had made cultures at the Long Island College Hospital of 3 or 4 well-defined cases of chorea and in none had they found any organism; it might be that their technique was faulty, but nothing grew in any of these cultures. Of course this was not a large number of cases, and it did not mean that it should lead them to the conclusion that there was no infection, but it did mean that the particular organism which had been mentioned had not been found; if this organism was the cause of the disease it must be constantly found in the disease, and as it was not found to be constant it could not be regarded as the cause of a chorea.

Dr. Israel Strauss, in closing the discussion, said that he quite agreed with Dr. Koplik that it was most unfortunate to use the term rheumatism in the way it was done, for no two or three men agreed as to what they meant by the term. But to go to the question of acute polyarthritis and chorea they could not say that the streptococcus viridans was the agent producing these affections. At Mount Sinai Hospital Dr. Libman's work was such that they were certainly competent to isolate this organism if it was in the blood and yet they had not isolated it from the blood in chorea, though they had made cultures both aerobically and anaerobically. He did not believe that if the streptococcus viridans was there it would have been missed. Another point in connection with the relationship of chorea to rheumatism was the treatment. In chorea one did not get good results from the use of the salicylates; they did not get the results that they did in polyarthritis. On the other hand, they had tried neosalvarsan in chorea and sometimes with surprisingly good results. This suggested that a protozoon might be involved. They had no right to say, however, that because rheumatism occurred and was followed by chorea the latter was due to the same cause as the former, neither could they say, because endocarditis had been found in 21 per cent. of the cases of chorea, that the endocarditis and chorea were due to the same cause. They could not say that rheumatism, endocarditis and chorea were in the same etiological chain. When we have a severe case of chorea insaniens we cannot save it no matter what we do, and we may find an acute parenchymatous nephritis, endocarditis, or even an acute encephalitis, and yet one cannot say that these are due to infection always. Therefore, although we may say chorea appears in association with and follows other diseases which are due to infection, we are not justified at the present time in any more definite statement of its etiology.

THE PHILADELPHIA PEDIATRIC SOCIETY.

January 12, 1915

W. N. Bradley, M.D., President.

LIQUID PARAFFIN IN INFANTS

Dr. H. K. Hill described liquid paraffin as a tasteless, odorless, transparent mineral oil, recommended by Arbuthnot, Lane and others for chronic intestinal stasis. When given in large doses, he had observed excellent results in chronic constipation in infants. He noted less satisfactory results in the initial treatment of severe gastroenteritis, as castor oil seemed to produce a more thorough cleansing of the intestinal tract and the secondary constipating effect was desirable. In conjunction with lactic acid bacilli very remarkable results may be obtained in that group of diseases caused by the action of putrefactive and allied poisons absorbed from the intestines. Among these may be mentioned asthma, some forms of diabetes, migraine, cyclic vomiting, convulsions, chorea, enuresis, some forms of eczema and many severe teething cases. (See page 96.)

PELLAGRA IN CHILDHOOD

Dr. F. C. Knowles read a comparative study of pellagra, in relation to the adult and child. He studied the age, sex, race, heredity, influence, cutaneous, nervous and gastrointestinal manifestations of the disease. The diseases which preceded or were frequently found associated with pellagra in childhood were also discussed. The prognosis in childhood was mentioned, and a considerable number of references were given.

Dr. J. P. Crozer Griffith wished much to hear what Dr. Knowles had to say about the etiology of pellagra, from his study of the literature. He had been impressed by reading Sambon's publications to the effect that the disease was probably caused by the bite of the simulium. Since then other insects had been accused. It seemed pretty well recognized now that healthy corn had no effect in producing pellagra, but whether it was an infection transmitted through the bite of an insect or a food intoxication produced by the action of some mould was by no means known. He thought Dr. Knowles could perhaps give a summary of what he had learned by the study of the subject.

Dr. **Knowles** answered that the etiology of pellagra still remained shrouded in doubt. He had attempted to compare pellagra in childhood with the disease as observed in the adult. He had recently seen 2 cases in children.

EDEMA COMPLICATING GASTROENTERITIS

Dr. **John F. Sinclair** read this paper, prepared by Dr. Joseph A. Speed and himself. (See page 100.)

Dr. **Hill** spoke of the possibility of using calcium chlorid in place of sodium chlorid in cases of edema.

Dr. **Bradley** referred to the fact that infants with edema did not always recover. He spoke of an autopsy he had recently performed in an infant with edema, in which nothing was found to explain the condition.

Dr. **Sinclair** added that research work has shown that in only certain cases was it justifiable to use sodium chlorid for edema. It cannot be used in every case. He feels that toxins play a large rôle in the etiology of edema.

THE SCHICK TOXIN REACTION FOR IMMUNITY IN DIPHTHERIA

Dr. **J. A. Kolmer** read this paper, prepared by Dr. Emily L. Moshage and himself. Schick has proposed a simple clinical test for immunity to diphtheria consisting in the intracutaneous injection of one-fiftieth the minimal lethal dose of toxin for a guinea pig. If there is less than one-thirtieth of a unit of antitoxin in each cubic centimeter of the patient's serum, the injected toxin acts as an irritant and produces an inflammatory reaction. If one-thirtieth of a unit or more of antitoxin is present the toxin is neutralized, no reaction follows and the individual is regarded as being immune to diphtheria.

The test has been advocated as a means of testing the response to active immunization with toxin-antitoxin mixtures and to detect susceptibility to diphtheria.

The objects of this study were as follows:—

(1) To apply the toxin skin test to a large number of apparently normal persons to determine susceptibility to diphtheria at different ages.

(2) To determine quantitatively the antitoxin content of the blood serum of persons reacting positively, slightly positively, doubtfully and negatively, in order to further study the toxin test

under conditions where the quantity of antitoxin in the blood is known.

(3) To study the degree and duration of immunity to diphtheria in normal persons following an injection of diphtheria antitoxin.

(4) To study the degree and duration of immunity among persons suffering with scarlet fever and receiving an injection of diphtheria antitoxin.

(5) To study immunity during and following an attack of diphtheria.

(6) To study the practical value of the toxin skin test, in determining which persons should be immunized with antitoxin when exposed to diphtheria.

The technic consisted in the intracutaneous injection of one-fortieth the minimal lethal dose of toxin for a 250 to 300 gram pig diluted to 0.05 c.c. with normal salt solution. Reactions measuring more than 3 mm. in diameter were regarded as positive. A characteristic reaction appears within forty-eight hours and consists of an area of redness measuring a centimeter or more in diameter, accompanied by some edematous infiltration and followed by a brownish pigmented area. A cutaneous technic employing undiluted toxin was also used, but was given up in favor of the intracutaneous method. It is necessary to titrate the toxin every two or three weeks, as it deteriorates.

(1) In all, 1,265 inoculations were made. Of these, 447 were among persons most of whom were healthy and well; a few were suffering with various chronic diseases and were tested while in various hospitals in Philadelphia. The following table shows the percentage of positive reactions in persons of various ages:—

Age	Total Tested	Reaction Positive	Reaction Negative	Per Cent. Positive
Under 1 year	25	3	22	12
1- 2 years	21	9	12	43
2- 4 "	18	12	6	66
4- 6 "	12	9	5	58
6- 8 "	14	8	6	57
8-15 "	21	5	16	24
15-30 "	142	60	82	42
Over 30 years	194	55	139	28
Total	447	159	288	41

The reaction has demonstrated that children between the ages of one and eight years are most susceptible to diphtheria.

(2) The serums of a number of persons were tested for antitoxin content with the following results:—

(*a*) The serums of persons reacting negatively to the toxin test usually contain at least one-twentieth of a unit of antitoxin per cubic centimeter of serum.

(*b*) The serums of persons reacting weakly positive to the toxin test usually contain from one-fortieth to one-sixtieth of a unit of antitoxin per cubic centimeter of serum.

(*c*) The serums of persons reacting strongly positive were found to contain less than one-twentieth of a unit per cubic centimeter of serum and frequently none at all could be detected.

These results corroborated those of Schick, Park and Zingher.

(3) The duration of passive immunity to diphtheria was studied in 106 persons by applying the toxin skin test at varying intervals after the administration of 1,250 units of antitoxin subcutaneously. The results are given in the following table:—

Days after Antitoxin	Total	Reactions Positive	Reactions Negative	Per Cent. Positive
1- 5	10	0	10	0
5-10	18	0	18	0
10-20	12	3	9	25.0
20-30	14	4	10	28.5
30-50	36	13	23	36.1
Over 7 weeks	116	27	9	43.7
Total	206	47	79	

Among children of the age of these a positive toxin reaction could be expected in about 40 per cent. The immunity conferred by 1,250 units of antitoxin was apparently efficient for ten days; after this interval antitoxin rapidly disappeared, so that after four to six weeks the immunity may be regarded as having entirely disappeared.

(4) The toxin skin test was applied to 362 persons in the various stages of scarlet fever and at varying intervals of time following the subcutaneous injection of 2,500 units of antitoxin

to study the duration of passive immunity in scarlet fever. The results are given in the following table:—

		Reactions		Per Cent.
Days after Antitoxin	Total	Positive	Negative	Positive
1- 5	60	2	58	3.3
5-10	45	3	42	6.3
10-20	65	9	56	13.9
20-30	77	17	60	22.0
30-40	50	17	33	34.0
40-50	37	21	16	56.7
Over 50	28	19	9	67.8
Total	362	88	274	

It was found that in scarlet fever passive immunity following an injection of diphtheria antitoxin is of shorter duration than that induced among normal children in that 10 per cent. of the former are susceptible within ten days after receiving antitoxin.

(5) The toxin test was also applied to 350 persons, mostly children, suffering with diphtheria and receiving from 10,000 to 100,000 units of antitoxin by subcutaneous injection. As will be found in the accompanying table, the high percentage of positive reactions during the first ten days of the disease and after large doses of antitoxin was quite surprising. As a general rule, these occurred among children with severe infections. It was also found that patients were in general just as susceptible after an attack of diphtheria as before; in other words, it would appear that the body cells produce little or no homologous antitoxin and the immune antitoxin is soon eliminated.

		Reactions		Per Cent.
Days after Antitoxin	Total	Positive	Negative	Positive
1- 5	81	11	67	17.2
5-10	86	22	64	25.5
10-20	96	33	63	34.3
20-30	40	14	26	35.
30-50	28	13	15	46.4
Over 50	19	13	6	68.4
Total	350	109	241	

(6) Practical experience with a small epidemic of diphtheria has increased our confidence in the toxin test as a means of de-

tecting persons susceptible to diphtheria. The chief practical value and application of this test is the detection of non-immune individuals and immunizing those only instead of all persons indiscriminately. The reaction has a special field of usefulness in hospitals and wards for the care of children. In the presence of an outbreak of diphtheria the physician should take cultures and apply the toxin test to all contacts. At the end of twenty-four hours he has the evidence of both at hand and antitoxin may be given to those only who react positively. This means a saving of antitoxin and the avoidance of disagreeable serum sickness.

While cultures were made of a large number of the persons tested there was found no constant relation between the occurrence of diphtheria bacilli in the upper air passages and the toxin test. In a person showing symptoms of infection as a tonsillitis or a dirty nasal discharge with diphtheria-like bacilli in the cultures a positive reaction is of aid in establishing the diagnosis of diphtheria on the basis that the person is at least susceptible; a negative toxin test tends to exclude diphtheria on the basis that the person is thereby shown to be immune to the infection.

Dr. Griffith had been impressed by the two charts showing the increased percentage of Schick reactions in those who were suffering from scarlet fever and from diphtheria itself. If Dr. Kolmer was right, that the scarlet fever chart was an indication that patients with scarlet fever were more liable to contract diphtheria, it must be true, even to a greater degree, of that for diphtheria. This chart showed that even after fifty days over 50 per cent. of cases will give a Schick reaction. It was reasonable to suppose that this reaction must persist, perhaps for a long time; and he would like to ask whether this was not a confirmation of the belief that individuals who have once suffered from diphtheria have an increased liability to develop it again. Dr. Griffith was hoping for great things from this reaction, combined with the von Behring toxin-antitoxin treatment, in hospital practice. Both the University and Children's Hospitals gave a prophylactic dose of antitoxin to every child upon admission; yet there were many instances in which he hesitated to give this on account of the condition of the infant. In view of this and of the very short duration of protection which antitoxin gives, as shown by Dr. Kolmer's charts, it would be most desirable to be able to determine positively whether or not the child needed immunization;

and then to treat it in some way which would give a much longer protection than the present method affords.

Dr. Hill referred to the pseudo-reaction and asked Dr. Kolmer whether the reaction shown by the twenty nurses and physicians at the Municipal Hospital who were exposed so constantly to diphtheria, but did not contract the disease, might not have been pseudo-reactions, just as was seen in the case of the resident physician whom Dr. Park showed recently in New York, who was apparently immune.

Dr. Gittings said that these figures for susceptible adults were larger than those of Schick and hardly seemed to show the disproportion in susceptibility between children and adults which one would expect, upon the basis of clinical experience. The proportion of susceptible children during convalescence from diphtheria also seemed astonishingly high, if the disease itself were to confer any active immunity. He asked Dr. Kolmer whether or not Schick tests had been made after toxin-antitoxin immunization, for comparison both with the effects of antitoxin and with the effects of clinical diphtheria.

Dr. Kolmer spoke of one man, with highly virulent bacilli in his throat, killing a guinea pig, but without any clinical symptoms, whose Schick reaction showed him well protected from diphtheria. In the presence of symptoms, as an angina showing staphylococci or streptococci and diphtheria-like bacilli or a dirty discharge from the nose showing diphtheria-like bacilli in cultures, a positive toxin reaction indicates that the patient is susceptible and that true diphtheria is a possibility; a negative toxin test, however, is of more value in excluding diphtheria in the diagnosis on a basis that the patient is probably immune. The pig test alone proves the harmfulness of the bacilli found. Dr. Kolmer has not yet used toxin-antitoxin mixtures except experimentally in the lower animals. He has not found any family predisposition to diphtheria that could not be explained upon other grounds. The work would indicate that in general persons recovering from diphtheria are at least just as susceptible to diphtheria as they were before the attack or as persons who have never had the disease. Pseudo-reactions are quite unusual and personally we regard all reactions evidently not traumatic as true toxin reactions.

The President then delivered the Annual Address.

DEPARTMENT OF ABSTRACTS

Original Condensations of Current Pediatric Literature by the Editors and the Following Associates

T. Wood Clarke,	Utica, N. Y.
Coleman W. Cutler	New York City
Charles E. Farr	New York City
Morris Friedson	New York City
Gaylord W. Graves	New York City
Jerome S. Leopold	New York City
William Lyon	Jackson, Mich.
Stafford McLean	New York City
Carlo D. Martinetti	Orange, N. J.
Raymond B. Mixsell	Pasadena, Cal.
Rudolph D. Moffett	New York City
Willard S. Parker	Boston, Mass.
Mark S. Reuben	New York City
Mills Sturtevant	New York City
Samuel W. Thurber	New York City
Eugene F. Warner	St. Paul, Minn.
Edwin T. Wyman	Boston, Mass.
J. Herbert Young	Newton, Mass.

Brandes, A.: The Clinical Picture of Juvenile Osteochondritis Deformans. (Med. Klin., July 12, 1914.)

Brandes has had under observation in the Kiel clinic 10 cases of this nature, occurring in children from three to fifteen years of age, and in boys more often than in girls. The disease has a distinct course and pathology and must be considered a separate clinical entity. The onset is insidious with slight limp and pain in the affected hip. The limp progresses until it is quite pronounced. Examination reveals slight atrophy of the muscles of the thigh and a prominent trochanter. There is little or no tenderness on pressure, shortening is under 2 cm., all motions are free except abduction, which is very greatly limited, while rotation and adduction may be slightly limited. The X-ray examination reveals a disintegration of the head of the femur beginning beneath the cartilage and rarely extending to the acetabulum. The course is chronic but the outcome is usually good. Differential diagnosis must be made from coxa vara and acute infections of the hip as well as tuberculosis. C. E. F.

Barkan, Hans: Infantile and Juvenile Tabes. (California State Journal of Medicine, December, 1914.)

About 20 per cent. of all adult cases of tabes are first diagnosed as such in the eye clinic. From 20 per cent. to 40 per cent. of all adult cases develop optic atrophy, while in juvenile tabetics the percentage of optic atrophy is from 90 per cent. to 95 per cent. Only 73 cases of this disease have been reported up to the present time, and Barkan in this article reports 6 further cases and comments on 6 previously reported. The chief characteristics of these cases are a positive Wassermann, optic atrophy, which ends in hopeless blindness, Argylle-Robertson pupils and loss of patellar and Achilles reflexes. Like the adult cases, the motor exercise which beginning blindness forces upon these patients can restrain motor instability, so that ataxia is very rare. The title of infantile tabes is rather misleading, inasmuch as the 12 cases reported range in age from seven to twelve years, the average age being thirteen years and six months. R. M.

KERN, HANS: THE INJECTION OF NEOSALVARSAN BENEATH THE FASCIA IN CHILDREN BY WECHSELMANN'S METHOD. (UEBER DIE ANWENDUNG DER EPIFASCIALEN NEOSALVARSANINJEKTIONEN NACH WECHSELMANN IM KINDESALTER.) (Berlin Klin. Woch., October 26, 1914, p. 1,742.)

Kern describes results obtained in experience dating from 1909, in a ward with 22 beds, for congenital syphilis. He comments on the difficulty of finding veins suitable for intravenous injections in infants and explains the method of injecting solution directly upon the fascial layer of muscle. By this means a depot is established and the spirochetæ are subjected to a slow, continuous application of arsenic. He uses a 100 per cent. concentrated solution of neosalvarsan, dissolving the product in sterilized tap water; 0.015 g. per kilo weight the amount, and even when the infant requires as much as 0.1 g. neosalvarsan the entire solution to be injected is not more than 0.3 c.cm. The injection is given with a 0.5 c.cm. Record syringe. Kern has used this method in 50 different cases, in ages ranging from two to seventeen months, and in all gave 148 injections. With good technique there is no infiltration at the site of injection.

S. McL.

WELDE, E.: THE PRESENT-DAY INSUFFICIENT TREATMENT OF HEREDITARY LUES. (DIE HEUTIGE UNZUREICHENDE BEHANDLUNG DER LUES CONGENITA.) (Therapeut. Monats., September, 1914.)

Of 396 infants treated for congenital syphilis in Heubner's service at the Charité, the late results could be determined in 200. Of these, 94 died in the hospital, 10 soon after discharge, 14 later on from contagious diseases, leaving 82 living children to be examined. Of these, 36 were traced and examined, and only 9 found free from evidences of syphilis and with negative Wassermann reaction. This appalling state of affairs is due, in large measure, to the indifference of the parents or to carelessness on the part of the physician. Persistent treatment with both salvarsan and mercury is the only way to effect a cure. An effective follow-up system is advocated by Welde, and he urges, in addition, the establishment of state institutions for the treatment of these cases instead of waiting until they are only fit for the institutions for the blind, the feeble-minded, etc. The nutrition of these cases is of especial importance, as is their protection from contagious diseases. C. E. F.

MUESCHAUSEN, HANS: THE FASTING METABOLISM OF INFANTS. (Boston Medical and Surgical Journal, July 30, 1914, p. 185.)

The author reviews the work so far done in the metabolism of fasting infants. He does not consider the infant as fasting until a period subsequent to twenty-four hours after taking food. He determined in infants of several months of age the protein combustion, the respiratory exchange, and the elimination of acetone and B-oxybutyric acid, having previously found that the combustion of material during fasting depends greatly upon previous food, the experiments were done both on breast and bottle-fed infants. The breast-fed baby was found to eliminate more nitrogen per kilo per hour during a feeding than during a fasting period. During the fasting period there was considerable water retention, also clinically shown by clearly noticeable edema. This edema disappeared during the recovery period (two days) with an increased water elimination.

In three experiments done on one infant there was found considerable water retention, a retention of nitrogen; during the recovery period a greater combustion of nitrogen on a more abundant nitrogen supply and during fasting a greater combustion of nitrogen when the previous food had been more rich in nitrogen. There was less protein decomposition during fasting in the breast-fed than in the bottle-fed. Acetone was found in traces in the urine of the nursling on the usual diet, but during fasting the excretion rose rapidly, quantities being found essentially in excess of those in fasting adults. The breast-fed excreted less than the bottle-fed children. If a fasting infant were given no protein and fat but allowed carbohydrate the acetonuria ceased. For this reason the author believes carbohydrate deficiency to be the causal factor in the origin of acetone both for the nursling and the adult. The excretion of B-oxybutyric acid ran parallel to that of acetone, its quantity being slightly higher. In a series of experiments on respiratory exchange it was found that in the first few hours after food the metabolism is increased and is supplied chiefly by carbohydrate, slightly by fat; twenty-eight hours after food the combustion of carbohydrate is much less, while the fat is being drawn upon in large measure. This relation becomes more marked the longer the fast. In all the experiments weight lost during fasting was immediately regained in the recovery period. W. S. P.

ZACHARIAS, E.: GENITAL HEMORRHAGE IN NEWLY-BORN GIRLS. (GENITALBLUTUNGEN NEUGEBORENER MÄDCHEN.) (Med. Klinik, November 1, 1914.)

Zacharias examined 400 newly-born girls to determine the presence of genital hemorrhage and found it present in 10, or 2½ per cent. The bleeding is without symptoms, subsides in a day or so, and is of no practical importance. In reviewing the literature on the subject the author found that in some of the cases mild bleeding persisted for from four to eight days. All of the children were unusually large and well developed. This he considers one of the causal factors of the condition. Halban attributes the bleeding to hyperemia of the uterus caused by a hormone developed in the placenta. C. E. F.

FRIEDJUNG, J. K. PROGRESS IN THE CLINICAL DIAGNOSIS OF HEREDITARY SYPHILIS. (PHYSIOGNOMIK UND THEORIE DER HEREDITÄREN SYPHILIS.) (Med. Klin., August 9, 1914, p. 1,345.)

According to the author the facies of hereditary syphilis is quite characteristic. He groups the children into three classes, according to age, from birth to six months, from nine months to two years, and from eight years on. In the first class the head and face are round like a ball, the complexion is a light coffee-color, and snuffles are usually present. In addition to this, one or more lymph nodes can usually be palpated, especially the epitrochlear. Enlargement of the spleen and liver is not uncommon. In the second class, rickets is universal. The skull is usually quite large from hydrocephalus or from bony outgrowths. The sutures are depressed at times. Marked anemia with a slight yellowish tint is common. The nose is broad and flat and there may be fine scars radiating from the mouth and nose. The liver, spleen and nodes may be enlarged.

In the third class the face is of a triangular shape with broad, overhanging brows and narrow chin. Here again the nose is of the broad, flat type, the eyes sunken, and fine scars may be observed around the mouth. The lips are thin, pale and, at times, distorted by the scars. Hutchinson's teeth are uncommon, but the enlarged nodes, especially the epitrochlear, may be felt. In general, these cases are under par mentally and physically.

Of 94 cases in which the test of physiognomy, as well as a physical examination, was found positive but in which no actual signs of active syphilis were present, 67 per cent. gave a positive Wassermann test. C. E. F.

TALBOT, FRITZ B.: ASTHMA IN CHILDREN. ITS RELATION TO "EGG POISONING" (ANAPHYLAXIS). (Boston Medical and Surgical Journal, November 5, 1914, p. 708.)

The author believes that sensitization to foreign protein, anaphylaxis, is the cause for some cases of asthma in children and cites cases in which egg seemed to furnish the exciting factor. The patients all reacted positively to a cutaneous test done by the von Pirquet method with egg-white. The more severe or highly sensitized cases reacted when egg-white was merely rubbed on the skin. A positive reaction is denoted by a red wheal at the site of application. Talbot believes that the evidence points to a local manifestation of anaphylaxis in the lungs; that the urticaria which is seen on the skin may occur on the mucous membrane of the bronchi, thus causing the symptoms.

Many, if not all cases, may be immunized to egg-white by giving small and gradually increasing doses of egg albumen in capsules. When immunization is secured the asthma stops unless the patient has an idiosyncrasy to some other foreign protein. Horse asthma is an anaphylactic phenomena due to protein of the horse and may be recognized by scarifying the skin and applying horse serum. A similar reaction to the egg reaction results. W. S. P.

FISCHER, LOUIS: THE ASSOCIATION OF FOLLICULAR TONSILLITIS WITH ACUTE GASTRIC FEVER—A CLINICAL STUDY. (Medical Record, November 2, 1914.)

This condition, seen in the infant as well as in the older child, occurs as a sequence to a deranged stomach and is characterized by a pin-point tonsillitis, which shows the presence of the staphylococcus—never the Klebs-Loeffler, nor the streptococcus. The cervical glands are never enlarged, the temperature is usually quite high, between 103° and 104°, and there is seldom pain on swallowing or any disturbance in the throat. Many cases subside without any local treatment and, indeed, the throat manifestations improve just as soon as the gastric symptoms subside. Therefore it seems that the gastric derangement is responsible for the fever, and too much importance cannot be placed on the necessity for throat inspection in every child that refuses to eat. The cause is usually hyperacidity; the treatment, the administration of an alkalin laxative until thorough evacuation has been produced. Locally for the throat tincture of iodin is used. The prognosis is good. Children invariably recover. H. R. M.

GISMONDI, A.: SUGAR IN INFANT FEEDING. (La Pediat., 1914, No. 4.)

In the healthy child lactose, saccharose and maltose are equally well digested and utilized. Gismondi proposes to give a mixture of the three, without exceeding the limits of tolerance for each kind, so that sufficient may be given to prevent excessive development of various germs and excessive fermentation. The mixture contains 40 per cent. lactose, 40 per cent. saccharose and 20 per cent. maltose and has given great satisfaction in a large number of cases. C. D. M.

SCHWARTZ, A. B.: A STUDY OF 200 CASES OF ENURESIS. (Boston Medical and Surgical Journal, October 22, 1914, p. 631.)

The study of these cases was carried on in the out-patient department of the Massachusetts General Hospital. He reviews the literature on the condition.

Of Schwartz's cases 148 were males, 98 females; 3 were diurnal, 134 nocturnal, 89 both diurnal and nocturnal. In a group of cases studied as to family history, the results were consistent with Klatz's idea of "neuropathic constitution." Thirteen cases of 21 operated upon for tonsils and adenoids showed no subsequent improvement, 6 were not heard from, 1 reported "better" and one spontaneously cured a year later. A study of the urine failed to show any characteristics peculiar to enuresis. In a large proportion of cases the urine was concentrated, the specific gravity high for the age.

Twenty-nine of the series showed abnormality of the genitalia; redundant prepuce 12, preputial adhesions 5, phimosis 5. Ten of these were circumcised, but only 2 of these heard from; 1 was improved, 1 not improved.

Digestive disturbances and anemia seemed to be no more frequent in this than in other groups of children. A nervous element, tic, chorea, retarded mentality, was found in the families of 56 of the cases. The results of treatment were similar to those of other writers. W. S. P.

MURRAY, H. LEITH: A CASE OF MESENTERIC THROMBOSIS IN YOUTH ORIGINATING FROM A CASEATING TUBERCULOUS GLAND. (The British Journal of Children's Diseases, July, 1914, p. 304.)

The patient, a girl of fourteen and one-half years, was seized in the afternoon with acute abdominal pain, which was sudden in onset, and severe and griping in character. She had been perfectly well the night before. There was no vomiting, she perspired freely and was acutely ill. Temperature was normal and pulse 140; the abdomen was slightly tender and there was no distention. By evening the pain greatly lessened and the patient appeared relatively comfortable. At the time there was a rather indefinite swelling above the pubes. As the patient had just finished her first menstruation it was thought that retained menses was the cause of her symptoms. Her past history showed occasional attacks of pain in the abdomen for the past few years. Tuberculous glands had been removed from the neck a few years previous, and her family history was markedly tuberculous. The diagnosis was doubtful, but hematometra seemed the most likely, and operation was decided to be postponed until the next day. At 4 A.M. there was an acute recurrence and at 6 she was in a state of collapse, with continuous vomiting and diarrhea since the recurrence of the pain. Operation was performed and six hours later the girl died. An autopsy showed a soft, caseating mesenteric gland with marked thrombosis of a group of the intestinal branches of the inferior mesenteric vessels. The peritoneal fluid was very foul and about ten feet of the small intestine was gangrenous. H. R. M.

BOULANGER, G,: APPENDICITIS IN INFANCY. (Thése de Paris, 1913.)

This paper considers 79 cases of appendicitis in infancy seen in the clinics of Kirmisson, Talaguier and Savariaud. Appendicitis is not exceptional by any means before the fifth year. In abdominal operations it has been found in 8.37 per cent. of cases. It is very rare in the first months. Females are more frequently found to have appendicitis. The cause of the inflammatory process is usually found in diarrhea, colitis, constipation. Principal symptoms are vomitus and pain, with either a rapid or slow onset. Fever and rapid pulse follow. Palpation is very difficult in babies; rectal examination gives better results. Prognosis is not always favorable. Treatment should be surgical.

C. D. M.

GRULEE, CLIFFORD G.: LABORATORY DIAGNOSIS IN THE EARLY STAGES OF CONGENITAL SYPHILIS. (The American Journal of Medical Sciences, November, 1914, p. 688.)

The author draws the following conclusions: (1) There is no test which is proved to be pathognomonic of congenital syphilis in the early stages between the birth and the development of active symptoms. (2) The examination of the urine and the routine examination of cerebrospinal fluid for globulin content and cells offers little evidence of value for the diagnosis of this stage of the disease. (3) The evidence as to the Wassermann reaction all goes to show the unreliability of the test at this age. (4) The Lange gold chlorid reaction on the cerebrospinal fluid offers at present some hope that the evidence obtained in this way may be of distinct value. (5) So far as we may judge from the luetin test as at present reported, active treatment with mercury materially influences it, so much so that without the mercurial treatments no cases have as yet proved positive. It may be said, however, that the Noguchi test has a distinctly negative value, inasmuch as in all cases not syphilitic the reaction was negative. H. R. M.

REMY-PERRIN: PERTUSSIS IN INFANCY. (Soc. de Mèd. de Nancy, July 2, 1913.)

In infants under two months old whooping-cough seems to follow a well-defined course. The catarrhal period is brief. Coughing spells are similar to those in older children. Duration is usually of one month and a half. Prognosis bad, not for the disease of itself, but for pulmonary complications, for strain during vomiting spells and for digestive disturbances. Contrary to general opinion, small babies are not immune, only less exposed. The author recommends for inhalation methyl salicylate in oil of eucalyptus (1:10 to 1:5), spreading the mixture on a napkin kept near the patient. C. D. M.

HENKIN, A. L.: PEMPHIGUS FOLIACEUS NEONATORUM. (Medical Record, January 9, 1915, p. 63.)

Seven days after birth the author noticed a "blister" on the abdomen near the umbilicus which was the size of a finger-nail, flaccid, filled with opaque fluid and no signs of inflammation. The following two days this bulla had extended to the right and the left, involving practically the whole abdomen. On attempting to remove the dead cutis the skin came off with it as a single cast; the epidermis of the entire body could easily have been removed. The surface beneath was red and weeping and looked like eczema rubrum. On the evening of the second day the temperature was 103.6°. The entire body presented a raw, red, weeping surface covered with serum. There were signs of failing circulation and septic absorption and the area around the umbilicus was gangrenous. No tubercular or syphilitic history. H. R. M.

TALBOT, FRITZ B.: A SUMMARY OF THE PRESENT KNOWLEDGE OF HUMAN MILK. (American Journal of Diseases of Children, June, 1914, p. 445.)

Talbot has made a most comprehensive review of the important facts relating to the secretion of the breast glands and the factors capable of influencing this secretion. An unusually complete list of 152 references to the literature on this subject accompanies the author's report.

Colostrum, according to Czerny and Keller, includes all milk in which there has been any absorption, not only during pregnancy and the early puerperium, but also when the secretion is drying up. Colostrum is not as sweet as milk, coagulates more compactly and contains more cholesterin and lecithin, and less fatty acids than does milk. In oleic acid, however, colostrum is richer than milk. The colostrum corpuscles are always present at beginning lactation. They disappear early, but reappear when nursing is interrupted. These corpuscles are ameboid and phagocytic. Even in healthy women the milk usually contains bacteria; most frequently staphylococcus aureus. Typhoid bacilli have been found by Lawrence in milk of a female typhoid patient and syphilis has been transmitted to rabbits by inoculation with milk from syphilitic women. The quantity of milk excreted in twenty-four hours depends on the weight and strength of the nursling, the average amount increasing from 4 grams in the first day to 384 grams on the tenth day for the baby of a primipara, and from 6 grams on the first day to 415 grams on the tenth day for the baby of a multipara. The average amount drawn by a breast-fed infant increases from 291 grams at one week to 1,000 grams at twenty-six weeks. (Czerny and Keller.)

The following figures represent averages of the various protein constituents: Casein, 41 per cent.; lactalbumin and globulin, 44 to 39 per cent., and residual nitrogen, 15 to 20 per cent. The several proteins are capable of differentiation one from another by complement fixation and anaphylaxis experiments, and the milk of animals of one species can be differentiated from that of another species through difference in the respective proteins of the two species. Human milk coagulates less readily and in more flocculent masses than does cow's milk. Precipitation of casein has been found to be most rapid and complete when 100 c.c. of milk (diluted five times) are acidified with 22 to 24 c.c. of $N/_{10}$ lactic acid (Bienenfeld), or with 20 to 30 c.c. of a strong acid (Engel), and then warmed to 40°C. Variations in the amount of albumin, while present during the same day, and even a single nursing, are not especially significant. The fat varies during a single nursing from between 1 and 3 per cent. in the first milk drawn to between 6 and 10 per cent. in the last portion. Volatile fatty acid constitutes 2.5 per cent. of the total fat. The corresponding figure for cow's milk is 27 per cent. Lactose is probably formed from the dextrose of the blood. The lactose is essentially the same in human and in bovine milk, but exists in much larger quantity in the former, the extremes found in human milk being 4.22 per cent. and 10.9 per cent. Other less important ingredients of human milk are lecithin, nuclein, calcium, iron, chlorin, phosphorus salts and citric acid. Of all the constituents fat shows the greatest variability. Wide variations in other constituents are not abnormal. The average composition of human milk is: Fat, 4 per cent.; lactose, 7 per cent.; protein, 1.50 per cent. (casein, 42 per cent., filterable nitrogen [including lactalbumin, globulin and unknown bodies], 58 per cent.); salts, 0.21 per cent.

Talbot's study of the influence of various foods and drugs in the milk supply seems not to justify the conclusions upon which clinicians have long based their practice. Czerny and Keller have shown that the milk of nursing mothers can be influenced by food intake only when the diet has previously been inadequate to ordinary physiological requirements. "The quantity of milk cannot be increased at will by increasing the amount of food and drink." The various so-called galactogogues, including extract of corpus luteum and pituitary extract, have likewise failed to prove of any certain value. Foreign substances administered to the mother, traces of which may appear in the milk, include potassium iodid, sodium salicylate, antipyrin, mercury, aspirin, calomel, arsenic, bromids, urotropin, alcohol (if taken in large amounts) salvarsan, and possibly morphin and atropin. Menstruation has not been shown to cause variations in lactation beyond the normal physiological limits. Exactly what emphasis is to be placed upon the influence of nervous impressions has not been established.

The study of milk enzymes has been rendered difficult by reason of the similar effects produced by the action of bacterial ferments and the impossibility of obtaining sterility without sacrificing the action of the milk enzymes. Proteolytic, carbohydrate-splitting and fat-splitting ferments, as well as oxydase and reductase are described in detail. It is noteworthy that the fat-splitting ferment, although active in the conversion of tributyrin into butyric acid in human milk, is very deficient and comparatively inactive in cow's milk.

The article concludes with a discussion of the "Transmission of Toxic Bodies and Immunity through Milk." Ehrlich has shown that immunity in many instances is conveyed through breast milk and that, although it was found impossible to immunize the human infant by feeding it with horse antitoxin, nevertheless the milk of a wet nurse immunized with this agent readily conferred immunity upon the nursing infant. "Immunity can, therefore, be transferred by way of the milk or albumins of the same species, but not by those of another." There is, furthermore, some evidence that immunity, and likewise the property of agglutination, may be acquired during intrauterine life. Sensitization to various poisons and albumins may be conveyed in the milk. G. W. G.

HOLT, L. EMMETT: MEDICAL *versus* SURGICAL TREATMENT OF PYLORIC STENOSIS IN INFANCY. (Journal of the American Medical Association, June 27, 1914, p. 2,014.)

In an excellent article covering his experience with pyloric stenosis in infancy, Professor Holt describes his results of medical and surgical treatment in this condition. His experience includes 57 cases, 18 of which were in private practice. The remaining 39 were patients in the Babies' Hospital, New York. He calls attention to the fact that there are an increasing number of cases seen, which indicates that the condition is becoming more recognized by the general practitioner, where formerly it was probably overlooked. In these 57 cases 52 were breast-fed, 40 of which had nothing else, and the other 12 had breast-feedings and some bottle feedings. Only 4 had nothing but the bottle, so that bad feeding can hardly be considered a cause of this condition. Of 55 of the cases, in which the sex was noted, 49 were male and 6 female. In four-fifths of the cases the first definite symptoms began in the third or fourth week, and in only 2 during the first week of life. This, Dr. Holt believes, is strongly against the idea that this condition is of congenital origin. In the majority of the cases the symptoms began abruptly, many mothers being able to give the day, and some even the hour, when the symptoms began. The rapidity of the development of the symptoms leads one to believe that a spasm of the pylorus plays a most important part, also the fact that there may be a disappearance of all symptoms in a few weeks points in the same direction. In the examination of the stomach in some of these children at necropsy, there have invariably been found hypertrophy of the pylorus, principally involving the circular muscular layer. This has led to some pathologists to consider this of organic rather than of functional origin. A temporary pyloric spasm undoubtedly occurs in many conditions, as in the projectile vomiting of cerebral disease, but definite persistent spasm of the pylorus, without hypertrophy is, Dr. Holt believes, yet to be proven. It was found in 26 necropsies, in this condition, at the Babies' Hospital, that there was a firm, hard, cartilaginous tumor present. The author believes that the term pylorospasm, as defining a group of these cases, should be dropped from our nomenclature. He also believes that the word pylorospasm is responsible for neglect of operation when operation might have saved life. In no condition is exact and early diagnosis more important for proper treatment. The most common, and usually earliest, symptom is vomiting. So characteristic is it that one can almost make the diagnosis from this symptom alone. It differs from the usual vomiting seen in young babies, which comes on after their nursing. This vomiting is projectile and forcible, the food being shot out of the mouth sometimes for a distance of four or five feet. It is a large amount of food, at times the entire contents of the stomach, and is usually repeated after each feeding. If the vomiting is infrequent and does not occur after each feeding, the amount ejected at one time is often much larger than the amount taken at the feeding time. Another important symptom in the diagnosis of this condition are the waves of gastric peristalsis, which have been so often described and which can usually be seen. Another important symptom is the palpable tumor which can usually be found by an experienced and careful observer, but it is not absolutely essential for diagnosis. An important means of determining pyloric obstruction, and its degree, is by measuring the amount of gastric retention. The child is fed a measured quantity and the stomach is emptied by aspiration three hours afterward. Dr. Holt uses the splendid apparatus which has been suggested by Dr. Alfred F. Hess, New York, for aspirating the duodenum. Constipation is usually present, and depends upon the absence of food from the intestinal tract. In the treatment of this condition there does not seem to be any special fixed rule, as men of large experience have been successful with different methods of treatment. Pyloric stenosis in infancy is generally reported with a mortality of 50 per cent. In the 57 cases in Dr. Holt's series there were 26 recoveries, and 31 deaths, a mortality of 55 per cent. There were operated on 28 patients with 14 deaths, and treated medically 29 cases with 17 deaths. The very bad cases were treated medically or operated on in about equal number. He considers the whole question between medical and surgical treatment to be: "Are the symptoms and conditions such as to make it probable that the patient will or will not live long enough for the pathologic condition to subside? There are medical risks and there are surgical risks, and in the individual case one must decide which are greater; the two must be carefully weighed, one over against the other."

He then describes the medical risk and the surgical risk with the post-operative treatment, and finally says, under choice of treatment, "Given an early diagnosis, a patient in private practice under conditions which make the best medical treatment possible, operation may not, in most cases, be required, but in hospital practice, in cases seen late, in those with the most acute symptoms, who are losing rapidly and when circumstances do not admit of the best medical treatment, there is no question in my mind but that immediate resort to surgery offers a better chance to recover." R. D. M.

PEYRI-ROCAMORA, A.: MICROBIC FINDINGS IN INTESTINE OF THE NEWBORN. (La Méd. de los Ninos, January, 1913.)

A study of several newly born babies showed meconium to be aseptic the first day. Germs appear later and rapidly develop. Virulent microbes are not found until the fifth or sixth day. There is a larger number of bacilli than of cocci.

C. D. M.

HASTUNG, H.: HEMORRHOIDS IN THE NEWBORN, ALSO A CONTRIBUTION TO THE ETIOLOGY OF HEMORRHOIDS. (Deutsch. Zeit. für Chirurg.)

The author reviews the most important theories as to the etiology of hemorrhoids, of which the following two are the principal ones: (1) The theory of Reinbach, which considers hemorrhoids as a new growth that is a cavernous angioma, and (2) the theory of Rydygier, which holds that hemorrhoids are a result of venous congestion produced by constipation, etc. The author then describes a case of hemorrhoids in a newborn which, on microscopic examination showed a cavernous angioma. According to him this case proves the theory of Reinbach, since in the newborn pressure could not be a causative factor. The author thinks, however, that in many cases in older children or adults congestion due to constipation or deviation of uterus may play a great rôle and may even be the producer of the hemorrhoids. A. L.

BOOK REVIEW

FEVER: ITS THERMOTAXIS AND METABOLISM. By ISAAC OTT, M.D., Professor of Physiology, Medico-Chirurgical College, Philadelphia; Member of American Physiological Society, Ex-President of American Neurological Association, Consulting Neurologist Norristown Asylum, Member of the Deutsche Medicinischen Gesellschaft of New York, Member of Vereinigung Alter Deutschen Studenten in Amerika, American Society for Pharmacology and Experimental Therapeutics, Society for Experimental Biology and Medicine, Member of the American Association for the Advancement of Science, Corresponding Member of Atlanta Academy of Medicine, Member of Philadelphia Medical Club and Chemists' Club of New York, etc. $1.50 net. New York: Paul B. Hoeber, Publisher.

The author has attempted in a book of 158 pages to give us a complete review of all the literature and all the theories that have been brought forth in the past forty-five years on the cause of fever. In his preface he says that these lectures were delivered before the Sophomore class of the Medico-Chirurgical College, Philadelphia, and the reviewer, after a careful reading of the book, feels that the sophomore students must have come from the classroom in a dazed condition. There does not seem to be any smoothness of style, or any connection between the paragraphs, but simply an elaboration of each of the numerous theories on this subject. The work is ably suited for the post-graduate student in physiology or for the practitioner who has given this subject a complete study. Work on metabolism is better than on thermotaxis, but they both cover the field and are complete in a review of the literature up to date, and would be well worth reading by those who are interested in this subject. The book is illustrated with fourteen figures, many tables and a splendid index of authors.

ARCHIVES OF PEDIATRICS

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EDITORIAL

ANOTHER CHANCE FOR PATERNALISM

If some medical Rip Van Winkle, fallen in with Henry Hudson and his men, at bowls, along in the early nineties, could awaken like his prototype and come down from the mountains into New York City, not at a slow pace with the help of his staff, but swiftly on the cushions of an eight-cylinder limousine as befits the changed time and place, he would be as bewildered at the state of things medical here, as was Rip by the changes in his own little village. No quiet leisurely round of calls in a victoria now, behind two sedately stepping bays; instead, a constant succession of vicious rings of the telephone and a mad scurry uptown and down-town at the tail of forty horse, a hundred demands upon his time to one in the old days, a hundred new institutions and organizations with which he is expected to be familiar.

Particularly would he be amazed at the manifold activities of the City's departments of health and education, if by chance he was a pediatrist before his long sleep. He would find an amazingly low death-rate for infants, brought about by education and the milk stations, he would find good hospitals for the care of contagious diseases and be amazed that diphtheria is no longer a scourge; he would find, in the schools, doctors and nurses inquiring into the health of the scholars, remedying dental, nasal and postural defects, supervising the light and the heating of the school-rooms; he would find special classes for backward children, and out-door or open-window class-rooms for anemic or pre-tuberculous ones; he would find under-nourishment attacked by school lunches, and boy gangs disorganized by the school athletics, so that the saloon keepers grumble.

If his mind were of the type which vainly attempts to stay the progress of equal suffrage, or rails at the "paternalism" which is "putting the doctor out of business," he might complainingly emit a jumble about "socialism," "too high taxes," and "lessened real estate values"; but if, as we think more likely, his twenty-odd years of companionship with the spirit of him who sailed the "Half Moon" had instilled into him something of that gallant captain's eagerness for new adventure, he would probably sit down and think of what he might contribute to the cause.

He might happen to think of that class of children who in the present scheme of municipal medical service seem to fall between two stools, the children between infancy and school age, the children from two to six, who play among the ash barrels and in the gutters all day while the older children are in school, and the babies are being hygienically brought up under the supervision of the milk station.

The children's classes of the various hospitals and clinics are the medical advisers for this group of children, and on the whole, they fulfil their duty toward them *when they get a chance.* But the mothers, busy with this year's yield of babies and not drawn to the ordinary dispensary by the lure of a cheaper clean milk which draws to the milk station, all too seldom come for advice for these little tots, who because they can run alone are allowed to do so, even to lying down on their little bellies in the street, pretending to be Belgian soldiers.

There is no concerted effort to get these children in under medical care; nor to instruct the mothers particularly in the ills to which this period of childhood is liable. Yet at this age can much prophylactic work be done, work which might eliminate many of the defects which are detected upon entrance to school. This is the period of primary dentition; the inviolable character of the first set of teeth should be preached strenuously. This is the time when adenoids and mouth breathing do maximum harm to the bones of the face and the palate. These are the years of greatest mortality among the contagious diseases; the moment when tuberculosis, waiting upon measles and whooping cough, finds its choicest opportunity. Now, rickets and poor nourishment, bad air and improper modes of living can have uninterrupted influence upon the bones and the nervous systems of these little ones, stunting their growth and helping to render inefficient the educational work of later years.

It is economy to insure excellence of raw material if the finished product is to be excellent. It is not economy to allow the raw material for our citizenship, upon whose education we spend so much, to deteriorate between the milk station and the school. An attempt should be made to extend the municipality's medical care in the hope ultimately to reach every future public school scholar before harm shall come to him.

If this be socialism, let us make the most of it!

THE CALIFORNIA PEDIATRIC SOCIETY

It is with pleasure that we note, and publish in this number of the Archives the report of the first meeting of the California Pediatric Society, a product of the Exposition year in that remarkable State; product also of the East which, as Dr. Lewitt intimates in his presidential address, sent Dr. William Palmer Lucas to the chair of Pediatrics in the University of California and to the secretaryship of the Pediatric Society. To the new organization, the Archives, on behalf of its readers, the pediatrists of every state, gives cordial welcome!

ORIGINAL COMMUNICATIONS

SOME SOURCES OF ERROR IN THE DIAGNOSIS AND TREATMENT OF LOBAR PNEUMONIA IN CHILDHOOD *

BY E. C. FLEISCHNER, M.D.
San Francisco

There is in all probability no disease to which children are heir in which the diagnosis is so frequently incorrectly made as in lobar pneumonia. As classical as the symptoms are in typical cases, variations in the symptom-complex are so numerous that many cases of lung inflammation run their entire course without sufficient evidence being present to warrant the diagnosis. The harmful effects of failure to recognize pneumonia in children are too apparent to justify much discussion. An enormous number of children running unusual fevers, to which very little importance is attached, and to which less attention is paid, who are allowed to be up and around as quickly as their symptoms subside, only too frequently develop acute cardiac and kidney disturbances because the original disease was not correctly diagnosed and proper convalescence instituted.

Several reasons account for the large proportion of cases in which pneumonia is not recognized in children:—

First—The frequent atypical nature of the disease.

Second—The absence of physical signs during the earlier stages of the condition.

Third—The failure on the part of the medical attendant to make repeated examinations.

Fourth—The difficulty in eliciting and interpreting physical signs in children.

The classical picture in pneumonia, as so frequently seen in adults, beginning with a chill, rise in temperature, increase in respiratory rate, cough, pleuritic pain, expectoration of prune-juice sputum, is so rarely seen in children as to be almost the exception.

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* Read before the First Meeting of the California Pediatric Society, San Francisco, December 9, 1914.

Text-books frequently call attention to the fact that the diagnosis of pneumonia is easily made if the pulse respiratory ratio, which is normally 4-1, is increased to 2-1; and one sees commonly emphasis laid on the fact that dilatation of the alæ nasi is always exceedingly suggestive of some interference in the respiratory function. It is truly regrettable that the positive diagnostic value of these symptoms does not correspond to what one sees clinically. That the respiratory pulse ratio may be typical in pneumonia, especially among some of the older children, is true, but in infants one rarely sees an acute febrile disturbance without the presence of this particular symptom. It is an exceedingly common experience to have mothers notice the rapid respirations instantly, and they will often suggest some disease of the lungs as the cause, but it is remarkable how rapidly this symptom disappears following the drop in temperature after free catharsis.

A brief consideration of the symptoms of lobar pneumonia in infancy and childhood impresses one with the futility of drawing accurate conclusions from either subjective or objective signs. The onset of the disease usually begins in a manner common to that of all acute infections. Chills are rather rare, except in older children; convulsions occur occasionally, but one is more apt to find simply a marked rise in temperature, increase in pulse rate and rapid respiration. The cough is not characteristic, especially in the early stages, and the pleuritic disturbance so frequently found in adults is usually absent. One glance at these symptoms is enough to convince one that they are conspicuously non-pathognomonic in character. How then is the diagnosis of lobar pneumonia to be made, granting that the symptomatology is so indefinite? Only by careful and repeated physical examination can the location of this so frequently obscure disease be made.

In discussing the physical signs of pneumonia in children, one's attention is particularly directed toward the changes in the early stages of the disease. There is very little difficulty attached to the diagnosis of a pneumonic process after the disease has been present four to six days, although even then the differentiation from pleuritic effusion is not always easy, but one meets in the early stages more than ordinary difficulty in eliciting characteristic signs.

Inspection—Where the dyspnea is pronounced, which, incidentally, is rare, inspection may be of some value. Otherwise it is a phase of physical examination from which few conclusions can be drawn.

Palpation—Here again in the early stages pneumonic processes reveal very little to the palpating hand.

Auscultation—That the auscultatory method gives us more information in the early stages of lung inflammation in children is definitely certain, but that these signs are the usual ones described in the text-book is as certainly not true. If one waits for bronchovesicular or bronchial breathing in these cases the diagnosis is not made until the disease has run the major portion of its course. Although very little attention is paid to diminished breathing in pneumonia, and although it is frequently given as a differential sign of effusion as opposed to pneumonia, there is probably no one sign which is so characteristic of the early stages of the disease as a diminution in the intensity of the respiratory murmur. It is strange, when one considers the pathology of inflammation in general, that this fact has not been more definitely recognized. There is no question but that diminished function is the most characteristic symptom of an inflamed process. Granting this fact, which warrants no argument, the logical conclusion would be that nature is not apt to make an exception in pulmonary tissue and her first effort to protect the inflamed lung would be directed toward lessening the amount of its work, diminishing as a result the respiratory murmur. Bronchial and bronchovesicular breathing only come when consolidation has so definitely taken place that the character of the respiratory murmur is bound to definitely change. Adventitious sounds, except those originating in the pleura, occur so late in the disease as to be of no diagnostic value in its early stages. One of the most helpful signs found by the stethoscope, especially in babies, is increased vocal fremitus. This is especially noticed in crying. There are cases of infantile pneumonia in which the only change in physical findings is an increase in the transmission of the crying voice.

Percussion—The changes found on percussion are very much more frequently present than they are described, due to the common error of heavy percussion in examining the chests of children. Where light percussion may definitely elicit dullness over the inflamed area, heavy percussion will fail absolutely in suggesting any abnormal change. This is so commonly appreciated by pediatricians as to make light percussion a watchword in the examination of children's chests.

X-Ray—Whereas in ordinary practice this method cannot be employed, in hospital work it forms an adjunct to which no other sign or symptom is secondary. Notwithstanding this, however, it is rather infrequently used in this connection. The findings are so typical and the changes so interesting that it is rather regrettable in children's hospitals that more extensive X-ray work is not done in differentiating the acute disease.

Differential Diagnosis—That the differentiation of pneumonia from all acute diseases is one of the most important features in dealing with the disease, is apparent from the description of the following cases, in which the diagnosis was confused with a number of ordinary very typical clinical entities.

Apparent Diagnosis—Acute meningitis. Baby C., age two, was taken acutely ill with vomiting, rise in temperature and prostration. She was seen twenty-four hours after the onset of the disease and the following signs noted: Patient lay in bed in a semi-comatose condition. Head was retracted, expression that of an acutely ill child. Throat negative. Thorax well developed. Respirations increased 40 to the minute. Heart negative, with the exception of marked increase in rate. Lungs failed to show any definite physical signs. Abdomen somewhat retracted, no masses or points of tenderness felt. Reflexes negative. Suggestion of Kernig sign on the right side, otherwise negative. Leukocyte count 24,000; lumbar puncture was done and clear fluid under moderate pressure withdrawn, which was microscopically and culturally negative. Twelve hours later the clinical picture had not changed appreciably; on examination, however, at the right apex there was diminished breathing, which was the first physical sign suggestive of pneumonia. Twenty-four hours later a typical lobar pneumonia of the upper lobe of the right lung was apparent.

Apparent Diagnosis—Appendicitis. W. K., age eight years, was taken acutely ill with rise in temperature, vomiting and pain in the right side of the abdomen. He was seen twelve hours after the onset of the disease as to the advisability of an operation for an acute appendicular inflammation, especially on account of the leukocytosis of 30,000. Physical examination showed a well-nourished, well-developed boy of about eight years. General appearance was that of an acutely ill child. Throat was negative. Glands negative. Thorax well developed. Heart negative. Lungs—Very light percussion revealed relative dullness over the right lower lobe and on auscultation the breathing was somewhat diminished. At times there was a suggestion of a pleuritic rub, but this was not characteristic. Abdomen—There was no distention, abdominal respiration was normal. Patient complained of considerable pain in the right iliac region corresponding to McBurney's point and extending upwards, but there was neither tenderness nor rigidity proportional to the amount of pain, nor did physical findings coincide with an appendicular inflammation of sufficient gravity to produce a leukocyte count of 30,000 and the general toxemia presented by the patient. The operation was deferred for twelve hours, at the end of which time the pneumonic changes were more apparent. At the end of twenty-four hours there was no longer any question of the diagnosis, the physical signs being characteristic and the abdominal pain had entirely disappeared, evidently resulting from the throwing out of a little serum over that area of diaphragmatic pleura which had been involved.

Apparent Diagnosis—Typhoid fever. J. B., age six years, was taken ill with loss of appetite, some rise in temperature and moderate prostration. First seen twelve hours after the onset. Physical examination showed moderately developed, moderately nourished boy of six years. Pulse, 120; respirations, 22; temperature, 102°; tongue, coated; throat, negative; thorax, well developed; heart, normal; lungs, apparently normal; abdomen somewhat distended, spleen palpable, some gurgling in the right iliac fossa; reflexes and extremities negative. This child had been in the country, where typhoid fever had been present in the house in which the patient was living and the mother was very solicitous as to the possibility of typhoid infection. The leukocyte count was 14,000, not suggestive of typhoid, but not completely excluding it. For one week the patient ran an acute febrile course without developing any typical signs. On the eighth day, over the middle lobe of the left lung, dullness was elicited and a few fine râles were heard. The temperature dropped by crisis and definite signs of a resolving pneumonia showed themselves.

The whole question of central pneumonia points out a phase which has been too frequently neglected. It is in this particular type of case that the diagnosis is never made and complications occur so often as the result of a neglected convalescence. The heart and kidney parenchyma unfortunately suffer quite as severely in this class of patients as in those cases where larger portions of the lungs are involved, so that it is equally desirable to prolong the treatment of the convalescence in these cases as in those in which the diagnosis is evident. This is why one cannot attach sufficient importance to repeated physical examination in children. It is true that the sick child should not be examined so frequently as to make the examination not only a source of annoyance, but actually a source of harm; but, on the other hand, one cannot be too decided in condemning the practice that is so frequently seen, of examining a sick child on one occasion, and then taking for granted that the findings never change.

Apparent Diagnosis—Pleuritic effusion. A. G., age ten years, had been ill two weeks with prostration, cough and a typical septic temperature. Physical examination showed a very ill child, with a characteristically septic appearance. Temperature, 104° ; pulse, 140; respiration, 50; tongue, coated and dry; throat, negative; thorax, well developed; breathing on the right side diminished. Percussion showed dullness over the whole of the right lung. Auscultation revealed diminished breathing of a distant bronchial character; no râles present. Vocal fremitus diminished. Left lung normal. Abdomen—Liver and spleen not palpable, no points of tenderness felt. Reflexes and extremities negative. The diagnosis was made of empyema, on account of the septic temperature and the typical physical signs. It was not possible at the time to introduce the needle, and the second visit was made twenty-four hours later for that purpose. In the meantime the temperature had dropped to normal, had remained there, and the physical signs had changed so that had not one been certain of his findings on the first examination it would have been scarcely credible that the condition could have changed so completely in so short a space of time. Râles were present over the whole lung. The dullness had diminished and the whole picture was characteristic of a resolving pneumonia. The case is interesting as illustrating the extreme difficulty encountered at times in differential diagnosis.

Were one to draw his conclusions entirely from his reading the differentiation between pleuritic effusion and pneumonia would be a problem so simple as to be scarcely worthy of discussion. This brings up again the question of diminished breathing. Had we at our disposal some method of determining between diminished breathing the result of inflammation of the lung and diminished breathing brought about by the presence of fluid in the chest, the problem would be indeed a simple one. Unfortunately, however, a diminished respiratory murmur affords no characteristic signs to aid in differentiating its causation. Likewise, to distinguish faint bronchial breathing resulting from a distant central pneumonia coming to the surface from that due to an effusion is very frequently impossible without the use of the exploratory needle.

This brings up for consideration the advisability of thoracentesis, unfortunately only too often neglected. No one should hesitate in the use of the exploration puncture, when the question arises as to the possible presence of fluid. No harm can come from its use. Failure to explore is often disastrous.

One might go on at great length in citing cases where errors in diagnosis have been made between obscure pneumonias and other acute diseases. Little would be gained, however, from these citations, were one to neglect calling attention .to the two cardinal points in lung diagnosis in children. First, careful, gentle examination. Second, repeated careful examination. Even with every effort certain cases will occur in which the diagnosis is made only very late in the disease. Let one at least always have the satisfaction of knowing that his errors have never been errors of omission.

As common as the errors are in the diagnosis of pneumonia their gravity and frequency are nothing when compared with the errors that are so frequently made in the treatment of the disease. There is probably no condition in the whole category of medicine in which the axiom, "Do not interfere too much with nature," is so properly applicable as in lobar pneumonia. No one who has seen many cases of this disease, especially in consultation work, can fail to have been impressed by the vast amount of improper and interfering treatment that is constantly employed. One might with great propriety sum up the therapy of pneumonia in three words—rest, fresh air and nourishment. The different modes and methods of treating pneumonic processes are so numerous that one finds it difficult to attack the problem in a logical way. It may perhaps be desirable to elaborate a trifle on the proper methods of treatment and then discuss some of the things that, though frequently employed, are distressingly harmful. That rest and absolute quiet are of paramount importance in treating this disease is perfectly apparent. The harmful effects of the pneumococcus toxin on the heart muscle are so evident that the value of complete quiet cannot be overestimated. Children with lobar pneumonia should not be allowed to wait upon themselves for anything. Tact in nursing is of immense value. The tossing pneumonic child is a constant source of menace to the toxic heart. In the category of proper rest comes the question of proper sleep and special emphasis must be laid on the necessity of obtaining sufficient sleep, even if it can only be obtained by the use of drugs. Were one to choose one drug to aid in the treatment of pneumonia, he would unquestionably select opium as the most valuable therapeutic aid. Notwithstanding the fact that not only text-books, but many teachers of medicine, warn against the use of opium and its alkaloids in the treatment of pneumonic infections, no drug saves the overworked organism as effectually.

Many cases of pneumonia that would wear themselves out can be spared the ravages of delirium and sleeplessness by the use of opium in sufficient dosage. As to what constitutes sufficient dosage, one might well say, "Enough to produce the desired result."

The fresh-air treatment of lobar pneumonia has become so definitely recognized that it is now practically used everywhere. Even so, one occasionally meets cases where the prejudice of the family against fresh air is so great that the child is deprived of one of its most potent needs.

Incidental to the anorexia accompanying the toxemia of pneumonia, only too many children suffer more from the effects of starvation than from the original disease. Here, again, tact on the part of the nurse is more than essential. Too many medical men insist upon these children receiving nothing but milk, when they are long past the age when milk appeals to them. Soft diet of any kind is easily tolerated, and it is far better to employ something that the child relishes than to force food against his will, exhausting him and proportionally lowering his resistance.

The value of catharsis in helping elimination is too apparent for discussion.

As to the question of external applications, much can be said for and much more against their value. If one agrees that ice is of use in treating pneumonia in adults, there is no question that it has value in treating pneumonia in older children. The prejudice against ice in pneumonia is far from justified. It is used commonly by medical men in treating meningitis, endocarditis, appendicitis and peritonitis. Why then should it not be used in pneumonitis? In babies the reaction to ice is not particularly good; in older children, however, there is no more excellent means of reducing temperature or relieving the mental symptoms. If ice is not useful in the external treatment of pneumonia, what is? Essentially nothing. With the exception of the occasional application of light mustard pastes as an aid to the failing heart, all poultices are of paramount danger. It is difficult to realize how logical physicians can explain the use of heavy poultices and pneumonia jackets in the treatment of this disease. Granting that a child under normal conditions is breathing eighteen times to the minute with a certain weight of clothing on the chest and back, is it logical to consider that he will be benefited by doubling the weight on his chest and on his back when he is breathing thirty to sixty times a minute? To say the least, it is hardly in accord with the general plan of rest in treating an inflamed part. Too much cannot be said in deprecating the use of the kaolin pastes in this disease. Not only are they of no therapeutic value, but they are truly a source of harm and damage. The question is frequently asked after the diagnosis is made of pneumonia, as to what the patient should have for his cough. With the exception of moderate doses of opium for the distressing cough of the concomitant pleurisy, nothing is of value. The frequent employment of so-called expectorant cough mixtures is more than deplorable in the early stages of pneumonia. There is nothing for the patient to expectorate and the noxious substances, such as ipecac and chlorid of ammonia, put into the stomach only serve to disturb the gastrointestinal tract and take away what may be left of the already markedly diminished appetite. Steam is sometimes used to lessen the irritating cough, but unless there is considerable inflammation of the larynx its value is very questionable. It has the decided disadvantage of necessitating the closing of windows during its use and for a considerable period after its use. In no acute disease does the question of heart stimulants assume the importance that it does in pneumonic infections, and in no disease likewise is overstimulation so frequently employed. It is a grave question as to the value of any stimulant in a case where the heart is suffering from the result of bacterial poisoning. An old, worn-out horse is never whipped, nor is it advisable to whip or overwork a worn-out heart. There is no question that in the treatment of heart complications opium again occupies a position that is secondary to no other form of medication. Oxygen, especially where the cyanosis is profound, is of unquestionable value and must be used constantly. Camphor in the form of the sterilized oil seems at times to produce results, and ammonia given as the aromatic spirits also occasionally seems beneficial. If the blood pressure were materially lowered in pneumonia adrenalin should be of value, but it is rarely lowered. Caffein defeats its own purpose, because it overstimulates the nervous symptoms so that the little value that the heart receives is more than counterbalanced by the irritation of the cerebrum that follows its use. Strychnin has been proven absolutely valueless. Atropin should be administered to those cases where there is a tendency to pulmonary edema.

The prognosis in lobar pneumonia in children when it does not complicate other diseases is usually good. Properly treated, most cases get well. Fortunately for the patients, improperly treated cases usually get well, in spite of the treatment. The ideal method of therapy will unquestionably be found some day in a specific serum of antitoxin; until that day arrives the clinician can best treat pneumonia by rest, fresh air, proper food and, above all, by strictly adhering to the principle that the best therapeutist is the one who helps nature in her fight against disease.

TEST FOR OCCULT BLOOD IN THE STOOL—Wagner (Arch. für Verdauungskrankh., Vol. XX., No. 4). A little of the stool (if formed, from its central portion) is spread over a clean slide. Over this the reagent is poured. The latter consists of a bit of benzidin, dissolved in 2 c.cm. glacial acetic acid, to which 20 drops of 3 per cent. hydrogen peroxide is then added. A blue color shows the presence of blood. The test is as delicate and as reliable as any of the other benzidin tests and has the advantage of cleanliness, since it involves a minimal handling of the stool. If one wishes to exclude extraneous ferments, which theoretically constitute a possible source of error, the slide carrying the film of dried stool may be passed through the flame, as in ordinary bacteriological work.—*Interstate Medical Journal.*

THE DIETETICS OF ECZEMA *

BY GEORGE D. LYMAN, M.D.
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It has long been decided that eczema is not purely an acute or chronic inflammation of the skin. If it were it would respond to local treatment alone, but the fact, in many cases, that it does not, proves that it is the symptom of some underlying condition, and there is no doubt but that the various products of imperfect metabolism, malassimilation and food toxins by circulating in the blood can produce or at least aggravate this condition in a predisposed subject. The old practitioners recognized the part the diet plays, when they designated the type of eczema occurring in nursing infants as "milk-crust." That food idiosyncrasies and gastrointestinal indigestion are important factors in many cases is proved by the improvement of the eruption, often without local treatment, which follows a straightening out of the intestinal condition. So important a factor is the diet in the treatment that it is a question whether eczema should be handled by the dermatologist or the pediatrician. At least they should coöperate, as a proper regulation of the diet accelerates a healing of the local condition.

Eczema occurs alike in breast-fed and artificially fed infants. It may be acute or chronic in character and may manifest itself in many types. With breast-fed babies there are many factors which must be taken into consideration and which have a contributing influence in its production.

There are two groups of cases:

First, the thriving over-nourished babies who are over weight for their age and who have shown manifestations of eczema since birth, and a second group of previously thriving babies who suddenly develop intestinal symptoms, cease to gain and develop eczema. In the one case the exciting element or underlying condition seems to have been present from birth. In the second group of cases, eczema appears to have developed with the intestinal upset.

In both groups of cases the maternal hygiene is often at fault. She is guilty of indiscretions in diet, over-feeding and over-

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indulgence, especially in meat and often in alcoholic beverages. She takes no exercise and is constipated. On examination the breasts are large and show evidence of a plentiful supply of milk. The milk itself reveals a high fat percentage. The infant is fed regularly enough, but in weighing it before and after nursing it is found to be obtaining an amount more than necessary for daily needs. This over-feeding with a fat-rich milk results in diarrhea or constipation. The eruption is localized usually on the face and head, with an emphasis on the cheeks. It is moist and exudating in character, sometimes with a tendency to crust over. The eczema shows a marked improvement on regulating the maternal hygiene; reducing the feeding periods and allowing a longer interval between them, and reducing the nursing period so that the quantity can be controlled.

In the second group of cases the stools should be examined for evidence of indigestion and with the cure of the intestinal condition an immediate improvement in the eczema takes place. No greater mistake can be made in these cases than to wean the infant immediately. Finkelstein has obtained good results in these eczema-dyspeptic cases by preceding each bottle with a casein preparation such as Nutrosa, of which he gives twenty to thirty grams a day in mineral water, or by substituting one or two feedings with buttermilk, to which small additions of carbohydrate are made. In this connection the report of Luigi Consiglio, an Italian, is interesting—five cases of dry recurring eczema in breast-fed infants were cured by feeding high proteids.

With the chronic cases no improvement is noted until the food is changed. A pure milk diet seems to aggravate these conditions, but as soon as the feeding is mixed, an improvement is noted. This is best accomplished by waiting for the end of the first quarter year, after which one or two feedings may be substituted for carbohydrate in the form of gruels or meal soup, and after six months vegetable purées may be added to the diet. It is still a question whether soup should be added or not. The French say not, as they look on eczema as symptom of a rheumatic diathesis and claim that eggs, soup and meat aggravate the condition.

With artificially fed infants acute exudating eczema appears to be associated with an intestinal indigestion, an intolerance for fat as well as for carbohydrate.

Talbot and Towle found that the eruption was vesicular in character, was limited to the cheeks, forehead and chin. The results of these investigations and method of dietetical treatment can best be explained by a partial quotation of two of these cases.

One baby, with a vesicular and exudating eruption involving the whole head and a few small areas on the body, was receiving as formula containing 4 per cent. fat, 7.7 per cent. sugar and 2 per cent. protein. The stools showed an excess of fats in the form of soaps which indicated that the infant was being given more fat than he could digest. Without making any change in the external treatment, the percentage of fat in the formula was reduced from 4 per cent. to 2 per cent. This change was immediately registered in the stools. Only one day later a slight excess of fat was found and the condition of the face improved perceptibly.

A similar eruption was found in an infant whose stools showed an excess of undigested starch. The baby was sixteen months old and receiving a condensed-milk formula (a food high in carbohydrate and low in fat content). In addition to the condensed milk it was also receiving potato, bread and butter. The face was unusually swollen and reddened and covered with vesicles ruptured, oozing and crusted. To a lesser degree the arms were affected. The itching was said to be intense. On examination the stools showed only a slight amount of soap, but macroscopically and microscopically a large percentage of undigested starch. With a decrease of sugar in the formula there was an immediate improvement in the stools, although the mother only partially followed out instructions. The eruption did not entirely disappear but became dry and infiltrated, and the itching was no longer troublesome. During the change in formula no change was made in local applications.

Both of these cases show the importance of a thorough and careful examination of the stools for evidence of indigestion, particularly of fats and carbohydrate. In one undigested starch, and in the other evidence of fat indigestion was found. On changing the formula a simultaneous improvement in stools and eruption took place, without making any change in the local treatment.

In their conclusions Talbot and Towle found that the vesicular exudating type of eczema was more frequently associated with an indigestion of fats than of carbohydrates, and that the close association of indigestion and eruption indicates that the digestive tract plays an etiologic relationship.

There seems no doubt that chronic eczema of the face and head is a symptom of a constitutional disease, which, at the same time or later, manifests itself in other symptoms—exudative in character—nasal and pharyngeal catarrh, angina, secondary swelling of the lymph glands, inflammation of the ears, asthma, bronchitis and circular caries of the teeth, with often a tendency to dyspeptic stools.

Czerny has named this condition "Exudative Diathesis." It is dependent on two factors—congenital predisposition and feeding. It has been proved, however, that the food and the indigestion play an intermediate rôle, since many infants presenting the same symptoms of indigestion as the eczematous babies do not likewise present a cutaneous reaction. This led Talbot to the conclusion that there is an underlying condition, probably systemic, which the eczematous infants possess, and which is lacking in the non-eczematous individuals. This underlying condition, this congenital predisposition, is the inherent defect of the organism which manifests itself as eczema and other related catarrhal conditions.

Old practitioners hesitated to cure chronic eczema because of its danger of "striking in." They observed the improvement of external manifestations was followed by asthma, bronchitis or dyspepsia—they did not connect these manifestations under the one head of an exudating diathesis.

In the treatment of this condition Czerny recommends avoiding fat and cutting down the quantity of the food. It is not necessary to bring about a loss of weight, but it should be brought to a standstill. The quantity of milk should be limited and as soon as possible the infant should be put on a mixed diet. To this end after the first quarter is passed, one to two feedings should be substituted with gruels. Care must be taken, however, that the quantity is not sufficient to cause a gain. Additions of broths and vegetable purées should be made as soon as possible, so that ultimately the quantity of milk given in twenty-four hours should not exceed one-fourth of a liter. Butter, cream and eggs are not allowed at any time.

Finkelstein has found that cutting down the food and a standstill in weight is not suitable to all cases of eczema. In fact, just the opposite is true in many cases—with a gain in weight there is an improvement in the eczema, which leads one to the conclusion that you cannot treat all cases of eczema as you would all cases of diabetes. The relationship between eczema, the quality and the quantity of the food are so manifold that we must have a more exact knowledge of the pathology and metabolism of infantile eczema before a precise indication for this or that feeding may be given.

Many infants who have been fed too richly by cutting down the food are influenced in the right direction. The undernourished, underfed infants, as soon as they begin to gain, show a disappearance of their eczema and related conditions. Talbot found that chronic eczema was associated with indigestion of more solid food stuffs. Other authors have found a protein indigestion with putrid stools and indican and phenol in the urine. Remedying the cause of this condition was followed by improvement in the eruption. On the other hand, Finkelstein was able to cure a certain type of cases by feeding them high proteids, high carbohydrates, fats and salt-free diet.

Meyer found in comparison to normal infants—those afflicted with eczema have a retention of salt; and the overnourished infant in putting on fat seems to be predisposed to a retention of salt which the organism is incapable of handling. A disturbed assimilation of the salts ensues—the excess entails the retention of an additional quantity of water to hold it in solution and as the circulation cannot handle this excess of fluid it passes out of the blood into the tissues and in this way excites or predisposes to eczema.

Finkelstein's theory was to supply the infant with a salt free, but fat, proteid and carbohydrate rich diet (it is prepared by removing the salts of milk by washing the casein in water and then mixing the curd with four-fifths water and one-fifth whey and forty to fifty grams of salt free carbohydrate).

This food has come to be known as "Eczema Soup." However, as before stated, it is not a universal healing method. A great many cases are not influenced by it one way or the other, which shows that the root of the lesion has not been encountered, but only an accidental factor which appears to aggravate certain types. The type which is influenced is the acutely inflamed, moist, sweeping, impetiginous one which occurs especially in large fat babes, who have put on considerable weight. Finkelstein warns that it only should be tried after other measures have failed, and only with large robust infants, who except for the eczema are entirely well, who can stand taking a high percentage of fat and losing considerable weight, as due to the withdrawal of salt from the food there is a marked loss of weight—10 to 12 ounces in a few days. It should not be tried for longer than two or three weeks, as the system cannot stand the loss of salt.

In the cases where it does succeed the results are immediate. After three or four days the inflammation begins to disappear, the secretion becomes less, and after one week ceases entirely. In the third week the condition may be considered healed, the itching entirely disappears and finally a stage is reached where salt free vegetables, fruit and other foods can be given without causing a relapse.

On reviewing the results of the dietetical treatment of this condition one realizes the great variety of the claims. Sometimes cutting down the quantity of the food is all that is necessary—the next time just the contrary, and the condition is not improved until the infant is fed up. With other cases neither the one nor the other is successful and help is only obtained by a complete change in the food. In these cases the qualitative and quantitative mistakes of the previous feedings must be abolished and the food suitable to the conditions present ascertained, so that a normal metabolism and assimilation may be brought about.

In the uncomplicated cases of eczema it appears that the fat and carbohydrate percentages are guilty. In some cases the salt assimilation seems to be disturbed. In the more chronic cases, there is often a disturbed protein digestion; still other cases are complicated by secondary and intestinal affections, and an immediate improvement takes place when the infections are healed, and the metabolism approaches normal. In other cases a reduction of the quantity of milk and going over to a mixed diet rich in vegetables and carbohydrate is the only successful means.

Of several things, however, we are certain—that local treatment alone or intestinal or dietary treatment alone are unsuccessful. It is necessary to joint forces, for the dermatologist and the pediatrician to proceed hand in hand; that in all cases of eczema it is necessary to make a thorough complete examination of the stools for signs of indigestion, and that above all else it is necessary to know and study your baby.

MORBIDITY AND MORTALITY OF THE ASSOCIATED CHARITIES FEEDING CLINIC—SAN FRANCISCO*

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AND

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As a preliminary to our paper a short sketch of the evolution of the Infant Feeding Clinic of the Associated Charities will be necessary.

The mortality in the Foundling Asylums which had formerly harbored these children was 59 per cent. The Associated Charities conceived the idea of boarding these babies out with foster mothers in order to insure individual care, and in this way even before the regular Clinic was inaugurated the mortality was lowered from 59 per cent. to 12 per cent., for it was not until 1909 that the regular weekly Baby Clinic of the Associated Charities was fully organized. In the fall of 1909 the Collegiate Alumnæ as an organization became interested in infant welfare and hygiene; this Committee as their special work, seeing the need for pure milk in the betterment of our babies, undertook to raise the funds to pay the difference between the ordinary commercial milk and certified milk for the foundlings in charge of the Associated Charities. Dr. Adelaide Brown, a member of the Baby Hygiene Committee, was appointed to put the feeding class on a good scientific basis. She conferred with Miss Felton of the Associated Charities and through her efforts the weekly Baby Clinic was established with Doctors Rude, Fleischner and Holsclaw as clinicians. Provision had already been made for a visiting nurse, Miss McCune, who is particularly adapted to the work, and it is through her untiring energy that we have been able to carry on this work successfully. At first the Clinic was an experiment. It was feared that the foster mothers who heretofore had had full charge of the babies would not be willing to bring their charges to the Clinic, nor follow the doctor's instructions in regard to their feeding and care. The visiting nurse persuaded eight foster mothers to attend the first Clinic; the attitude of these foster mothers was anything but encouraging. By tactful handling we were able to gain their confidence, and at present we have no difficulty in getting the foster mothers to bring the babies to the Clinic—even on rainy days we have from twenty-five to thirty babies. During the first year the average Clinic attendance was 17; from 1910 to 1911, 22; from 1911 to 1912, 25; 1912 to 1913, 35; 1913 to 1914, 38, or 140 per month for the past year.

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During the past year we have handled 61 babies with their own mothers, hoping in this way to teach them and educate them in the care and feeding of their children.

In addition to the babies which report to our regular weekly Clinic we also have under our care the small Receiving Hospital known as the Babies' Aid. These babies are counted on our list in making up our data for morbidity and mortality, and one must remember that many of these babies are thrown into the basket poorly protected, often with bleeding cords and at times have been subjected to a great deal of exposure; many of these babies have been worked over for hours by our nurses before showing signs of life. This is one of our sources of material for the Clinic.

The question has been asked by every medical person who has visited the Clinic, how, in bringing so many babies together, we have prevented the spread of contagion. The answer is this—the instruction to the foster mother is that she is not to treat the case herself, no matter how trivial the complaint; it must be reported at once to the visiting nurse; in the meantime all food is stopped. Many of these reports are trivial and do not need medical attention. Cases needing such attention are referred to the physician, who either sees the case at the office or at the patient's home, depending upon circumstances. Upon Clinic days any suspicious case is immediately isolated for inspection. All babies are visited in the foster homes by the nurses who give full instructions concerning the preparation of food, care of the bottles, nipples and general hygiene. Many cases, where the babies are very small or very delicate, are seen by our visiting nurses daily. We have few cases that come under our notice which require hospital care; any ailments which require a specialist are given such treatment.

The question to be presented to-night concerns the morbidity of the 800 infants we have handled during the past five years.

The data for 1909 and 1910, not being complete, is not included in this report.

Pertussis	CASES
1911	8
1912	14
1913	6
1914	13
Total (no deaths)	41
Rubeola	
1911	0
1912	9
1913	2
1914	5
Total (1 death due to bronchopneumonia)	16
Varicella	
1911	3
1912	0
1913	2
1914	1
Total (no deaths)	6
Pneumonia (Lobar)	
1911 (1 death, age 7 weeks)	2
1912 (2 deaths, syphilis at 7 months and 18 days)	4
1913	1
1914	1
Total (3 deaths)	8
Pneumonia (Broncho)	
1911 (3 deaths)	3
1912	0
1913 (2 deaths—1 age two days, other age 3 months)	2
1914 (3 deaths—1 measles, 1 harelip, getting nasal feedings; other 4 months of age)	3
Total (8 deaths)	8

Syphilis	CASES
1911	2
1912 (3 of which had lesions; remainder poor gainers with positive Wassermanns)	12
1913	4
1914	0
Total (10 deaths)	18

Tuberculosis

1911 (miliary—meningitis—2 deaths)	2
1912 (mastoid at 7 months—1 death)	1
1913 (2 deaths)	3
1914 (1 death)	1
Total (6 deaths)	7

Rickets (well developed before babies put under our care)

1911	0
1912	1
1913	1
1914	1
Total	3

Lymphadenitis (Acute cervical)

1911	4
1912	4
1913	3
1914	0
Total	11

Eye Cases

1911	0
1912 (conjunctivitis)	3
1913 (2 conjunctivitis—1 congenital cataract)	3
1914	0
Total	6

Ear Cases (Otitis Media)	CASES
1911	0
1912	3
1913	3
1914	2
Total	8

Tonsillitis (Acute)	
1911	0
1912	1
1913	3
1914	4
Total	8

Skin Diseases	
1911 (ringworm)	4
1911 (scabies)	2
1911 (eczema)	5
1912 (ringworm)	1
1912 (scabies)	1
1912 (eczema)	3
1912 (furunculosis)	1
1913 (ringworm)	1
1913 (scabies)	0
1913 (eczema)	1
1913 (furunculosis)	5
1914 (eczema)	1
Total for 4 years	25
Ringworm	6
Scabies	3
Eczema	10
Furunculosis	6

Convulsions	CASES
1911	0
1912 (by changing mothers cured convulsions)	2
1913 (1 hydrocephalus—1 pneumonia)	2
1914 (encephalitis)	1
Total	5

Oxyuris Vermicularis

1911	0
1912	1
1913	1
1914	2
Total	4

Operations for Tonsils and Adenoids

1911	7
1912	4
1913	10
1914	2
Total	23

Miscellaneous Operations and Diseases

1911 Pyloric Stenosis (Operation—died)	1
1914 Pyloric Stenosis (Operation—alive)	1
1911 Hydrocephalus (Operation—died)	1
1913 Hydrocephalus (Operation—alive and well)	1
1912 Umbilical hernia (Operation—cured)	1
1913 Tuberculosis of right shoulder (Operation—cured)	1
1913 Circumcisions	6
1914 Circumcisions	2
1911 Cord infection (Died)	1
1912 Cord infection (Died)	1
1913 Volvulus (Operation—died)	1
1913 Myocarditis (Died)	1

MORTALITY

1911 Total number of cases cared for 168
Deaths .... 10 Total mortality 5.8%

Causes of Death	CASES
Congenital syphilis	2
Tuberculosis	2
Pneumonia	4
Pyloric stenosis (Operation and surgical shock)	1
Cord infection (General septicemia)	1

1912 Total number of cases cared for 187
Deaths .... 12 Total mortality 6.4%

Causes of Death	
Congenital syphilis	4
Tuberculosis	1
Pneumonia	3
Cord infection (General septicemia)	1
Acute gastroenteritis	1
Birth injury	1
Hydrocephalus	1

1913 Total number of cases cared for 214
Deaths .... 7 Total mortality 3.2%

Causes of Death	
Congenital syphilis	4
Tuberculosis	2
Birth injury	1

1914 Total number of cases cared for 280
Deaths .... 8 Total mortality 2.8%

Causes of Death	
Tuberculosis	1
Pneumonia	5
Myocarditis	1
Volvulus (Operation)	1

City mortality for the current year is 10.2%

BENZOL TREATMENT IN A CASE OF LYMPHATIC LEUKEMIA, WITH AUTOPSY*

BY ALFRED EDWARD MEYERS, M.D.

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A white, male child, four years three months old, entered the hospital September 22d. The father's first wife died of tuberculosis eleven years ago, otherwise the family history is negative. Patient was delivered normally at full term, and was breast-fed for eight months. He had pertussis when one and one-half years old, and measles at three years. Was admitted as an outpatient on August 15, 1913, with the following history: "Two months ago fell down and broke two teeth; one week later became restless and fussy, developed a fever, and complained of pain in both knees, which continued off and on for two weeks. On the previous day had a severe nose-bleed. Appetite poor, bowels constipated, frequent micturition and some dyspnea. No edema. Physical examination showed moderate pallor, heart slightly enlarged to the left with a systolic murmur over the left precordia and transmitted to the axilla and back. Lower liver dullness 5 cm. below costal margin in the nipple line. Spleen not palpable. No blood examination was made." On the second visit to the hospital it was noticed that the pallor was increasing, that the spleen had become markedly enlarged and that the superficial lymph nodes had begun to enlarge. Had had no other noticeable hemorrhages. Was advised to leave child in the hospital for a routine examination, but refused. Came back two weeks later and complained that the abdomen was getting larger than normal; pallor very marked; appetite poor; no vomiting; bowels constipated. Physical examination at this time showed a well-developed and fairly well nourished child, marked pallor, slight prostration, somewhat drowsy, with a shuffling gait, droll speech and high-pitched voice. With the exception of pale conjunctivæ and buccal mucous membrane, the examination of the head was otherwise negative. The heart was enlarged to the left, the left border being 9 cm. from the midsternal line, with apex in the fifth space. Sounds were regular, rapid and of fair quality. There was a loud systolic murmur heard all over the left precordia, loudest at the apex, and transmitted to the axilla and back. The second pulmonic sound was accentuated. The lungs were negative; no d'Espine's sign was present. The level of the abdomen was slightly higher than that of the sternum, measuring 52 cm. in circumference about the umbilicus. There was a moderate amount of rigidity; no tenderness, masses or free fluid made out. Upper liver dullness in the fifth space; lower liver dullness 10½ cm. below costal margin in the nipple line. Edge sharp and easily palpable, not tender. Edge of spleen easily palpable, rounded, firm and hard, and extended 5 cm. below costal margin in the nipple line. The skin was negative. The posterior auricular and the epitrochlear lymph nodes were slightly enlarged; the anterior and posterior cervical lymph nodes were moderately enlarged bilaterally; the supraclavicular lymph nodes were very slightly enlarged; in the axillæ, inguinal and femoral regions the lymph nodes were about the size of beans. The remainder of the examination was negative. The urine was negative; no test was made for Bence-Jones body. Wassermann was negative. Blood pressure (Tycos) systolic 120, diastolic 75. The von Pirquet reaction was negative. The blood examination was as follows: Hemoglobin, 25 per cent.; white blood cells, 32,000; red blood cells, 1,424,000. The differential count with Wright's blood stain showed: polynuclears, 2.2 per cent.; mononuclears (medium variety), 97.1 per cent.; transitionals, 0.7 per cent. No normoblasts were seen in counting 200 cells. Achromia was marked; no stippling or polychromatophilia. Very few blood plates were seen. There was slight variation in the size and shape of the red cells. No myelocytes. Temperature, 102.5°; pulse, 160; respirations, 40.

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*This case was studied in the medical ward of the Children's Hospital, Boston, during the service of the late Dr. T. M. Rotch.

Course and Treatment—From September 22d to September 24th no treatment, other than rest in bed, was given. On the latter date benzol, minims ii, four times daily, was given in a teaspoonful of olive oil. On September 28th a second blood examination was made, showing: Hemoglobin, 28 per cent. (Tallqvist); white blood cells, 10,200; red blood cells, 1,664,000. Differential count showed polynuclears, 5.5 per cent.; large and medium mononuclears, 21.4 per cent.; small mononuclears, 40.4 per cent.; irregular basophilic staining cells (mononuclears), 30 per cent.; transitionals, 2.4 per cent. Marked achromia, slight polychromatophilia, no stippling, variation in size and shape of the red blood cells, very few blood plates seen; 2 normoblasts seen in counting 200 cells. Many degenerated lymphocytes seen. On September 28th a von Pirquet reaction was done, immediately after which the child became dyspneic and showed increasing difficulty in breathing, especially on inspiration. Developed a cough which was brassy in nature. There was marked retraction of the intercostal, xyphoid and supraclavicular spaces. Alæ nasi moved with inspiration. Child was conscious, could talk, but was very restless, sitting up and then lying down as if trying to obtain relief. Primary ether was administered with moderate immediate relief, child becoming sleepy, and in about two hours all signs of what seemed to be a laryngeal spasm had disappeared. Laryngoscopic examination was negative. On October 1st, benzol was increased to minims iii, four times daily. The general condition was much improved, the spleen was slightly larger and slightly tender on pressure. Liver dullness about the same. No complaint of burning in the stomach. No odor of benzol in urine or stools. The blood examination on

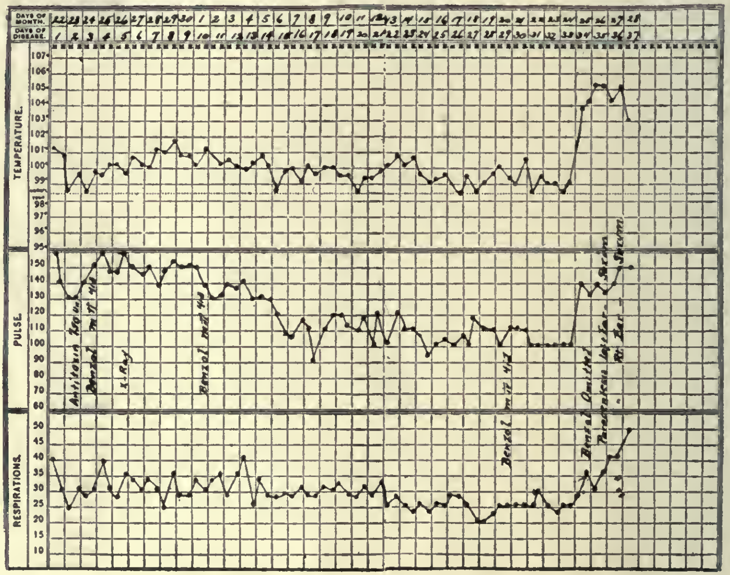

Fig. 1. Chart showing curves of temperature, pulse and respiration in their relation to administration of benzol

this date showed: hemoglobin, 25 per cent.; white blood cells, 8,600; red blood cells, 1,450,000. Differential count with Wright's stain showed: large mononuclears, 0.6 per cent.; medium-sized mononuclears, 28.8 per cent.; small mononuclears, 66.6 per cent. There were 24 degenerated and broken-down lymphocytes in counting 309 cells; also 2 large transitional cells, 1 small transitional cell, 1 normoblast and 1 megloblast in the same count; otherwise the condition of the blood was about the same as formerly. On October 3d two purplish spots, size of a quarter, were noticed on the back, at the level of the sacrum. No blood in stools or urine. Has a slight cough. There is a definite palpable thrill (systolic) at the apex in addition to the systolic murmur present on entrance. Appetite and bowels normal. On October 6th spleen is decreased in size, liver dullness about the same, very little difference, if any, in the size of the superficial lymph nodes. No purpuric spots. On October 7th, a fourth examination of the blood was made, showing: hemoglobin, 26 per cent.; white blood cells, 2,800; red blood cells, 1,392,000. Differential count showed: polynuclears, 10 per cent.; small mononuclears, 83.8 per cent.; large mononuclears, 5.5 per cent.; small transitionals, 0.7 per cent. There was slight polychromatophilia, marked achromia, considerable streaking, no stippling. Two megloblasts were seen in counting 300 cells. There was moderate variation in the size and shape of the red cells. The blood plates were noticeably increased, and fewer degenerated lymphocytes were noted in the smear. On this same date physical examination showed the spleen to be moderately decreased in size, liver and lymph nodes about the same. Blood pressure 105, otherwise no great change in condition. On October 11th, two small purpuric spots on the left leg, and two on the sacrum were noted. Spleen continues to decrease slightly in size. On October 14th, condition being generally improved, the child was allowed to be up and walk around. Heart condition about the same. Purpuric spots still present. No change in size of spleen. A fifth examination of the blood on this date showed: hemoglobin (Tallqvist), 27 per cent.; white blood cells, 7,000; red blood cells, 1,656,000. Differential count with Wright's stain showed: polynuclears, 14.8 per cent.; small mononuclears, 54 per cent.; medium-sized mononuclears, 32 per cent.; slight stippling and polychromatophilia; much achromia and streaking;

4 normablasts seen in counting 300 cells. The polynuclears seem to be increasing in size, otherwise examination the same as on October 7th. On October 20th, benzol was increased to minims iv, four times daily. One more purpuric spot was noted on right leg on this date; had a slight nosebleed; child seems to walk a little better; spleen and liver about the same. A sixth blood examination was made on this date, showing: hemoglobin, 30 per cent.; white blood cells, 10,400; red blood cells, 1,720,000. Differential count with Wright's stain showed: polynuclears, 7.5 per cent.; total mononuclears, 92.5 per cent.; in a count of 500 cells 6 megloblasts were seen; slight polychromatophilia; no stippling; blood plates again decreased in number. On October

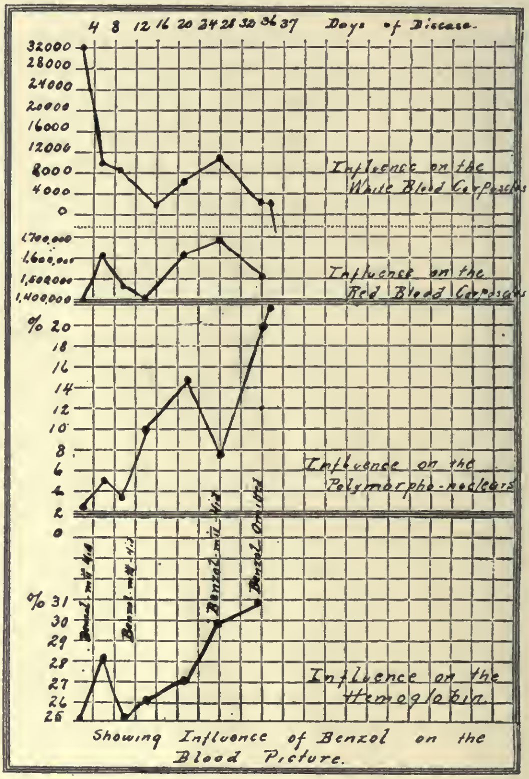

Fig. 2. Curves showing the influence of administration of benzol upon the blood picture

21st, another purplish spot was noted on the right leg, otherwise no marked change in condition. On October 25th, the temperature rose to 104°, pulse 140, and respiration 35, all having been practically normal the previous day. Benzol was at once stopped. No cause for the increased temperature could be found. On October 26th, temperature rose to 105.2°, pulse 140, and respiration to 35. Child seemed quite prostrated but rational, and complained of pain in left knee. Respiration was slightly decreased on the right side, otherwise lungs were negative. There was a loud systolic murmur heard all over the left precordia and transmitted to axilla and back. The size of the heart was about the same as on previous examinations. Sounds were of fair quality, regular and moderately rapid. The abdomen was negative. Mouth and throat were negative. The left ear-drum showed complete absence of landmarks, and broke on gentle irrigation; it was incised. The skin was negative. A seventh blood examination on this date was as follows: Hemoglobin, 32 per cent.; white blood cells, 2,350; red blood cells, 1,576,000; polynuclears, 12 per cent.; total mononuclears, 88 per cent. On October 27th the eighth and last blood examination was made, and was as follows: White blood cells, 2,040; polynuclears, 20 per cent.; medium-sized mononuclears, 43.6 per cent.; small mononuclears, 32 per cent.; large mononuclears, 1.9 per cent.; transitionals, 1.9 per cent.; no red blood count was made or hemoglobin estimated. The temperature, pulse and respiration were still elevated; splenic dullness, which had hitherto always been about 5 cm. below the costal margin in the nipple line, had disappeared; liver dullness 8 cm. below costal margin in the nipple line. Heart condition about the same. Few medium moist râles in both chests. Moderate pain along the muscles of extremities. Cremasteric and abdominal reflexes moderately increased. Double ankle clonus present. Babinski negative. No definite joint pain or swelling. Right ear drum showed complete absence of all landmarks and was incised, and serum having a foul odor was obtained. Superficial lymph nodes about the same. On October 28th the temperature was 103°, pulse 150, and respiration 150. Child was still very much prostrated, and death occurred very suddenly. Two hours before death a white blood count was made and found to be about 1,500. Immediately at death blood was obtained from the ventricle, and the white blood cells were practically absent.

AUTOPSY—The following report was submitted by Dr. H. T. Karsner, of the Harvard Medical School:—

Body—The body is that of a fairly well nourished, fairly well developed, male, white child, with no rigor mortis and very slight posterior lividity. A profuse growth of hair on the relatively large head. Pupils normal, but dilated; lips pale and teeth carious; left upper median incisor in its socket; tongue coated. Over the face several pale bluish-red, vaguely-defined, non-elevated spots, of a diameter varying between 3 to 6 mm., are found particularly on the left upper lid, over the left malar bone, the left side of forehead, the right malar bone, and in front of the lobe of the right ear; also over the left upper arm and left thigh. The penis also shows considerable hemorrhagic discoloration. The body is 103 cm. in length, no further marks of identification. Feet are extended, and the veins of the corsum distended. Easily palpable enlargement of all the superficial lymph nodes.

Primary Incision—Shows a moderate panniculus adiposis, extremely pallid musculature and no bleeding; peritoneum smooth and moist; stomach distended; appendix pointing upward and backward; abdominal viscera in normal situation except that the liver extends 7.5 cm. below the costal margin in the mid-clavicular line and 6.5 below xyphoid; spleen extends 3 cm. below the costal margin in the axilla; thoracic viscera in normal position; the thymus extends 4 cm. down over pericardium.

Pleural Cavities—Smooth and glistening throughout.

Lungs—Right lung moderately voluminous, pallid anteriorly and deeply congested posteriorly. In various parts of the surface blue areas are found, sometimes along the edge, sometimes in the middle of the lung, which are fairly sharply defined, solid, slightly retracted, measuring 3 to 5 mm. in diameter and extending the same distance into the tissue. Organ cuts with normal resistance and shows a moist, slightly reddened, cut surface, becoming deeper in color posteriorly. No excess of fluid can be expressed. Lung crepitates throughout except for the small areas mentioned. The pulmonary vessels show slight staining with hemoglobin. Bronchi normal, peribronchial lymph nodes enlarged, soft, moist and of a yellowish-gray color in the bulging, moist, cut surface.

Left lung like its fellow, except that posteriorly several minute punctate hemorrhages are observed immediately under the pleura.

Pericardium—Contains a slight excess of fluid, is smooth and glistening throughout.

Heart—Weighs 120 grams, shows in the pericardium numerous punctate hemorrhages; subpericardial fat is diminished; muscle is firm; cuts with normal resistance and shows a slightly retracting, firm cut surface, in which connective tissue striæ are more prominent than normal. Left ventricular wall measures 11 mm., left auriculo-ventricular orifice measures 6.5 cm., leaflets and chordæ tendinæ being normal. Aortic orifice measures 43 mm., leaflets and sinuses of Valsalva being normal. Right ventricular wall measures 3 mm. Right auriculo-ventricular orifice measures 7.5 cm., the leaflets being normal. Pulmonic orifice measures 4.5 cm., and the leaflets show moderate diffuse thickening. The thickening appears to be slightly more prominent toward the free edge of the leaflets. The endocardium is normal throughout, and the foramen ovale is barely patulous to a probe. Coronary arteries are normal; stump of the aorta is distinctly hemoglobin stained.

Thymus—Appears to be normal grossly, weighs 15 grams.

Lymph Nodes—The superior mesenteric lymph nodes, as well as those immediately overlying the diaphragm, show same type of enlargement as in the peribronchial lymph nodes.

Spleen—Weighs 125 grams, measures 11.5 x 6.5 x 3.5 cm. Capsule is slightly thickened and opaque. Organ is firm, cuts with normal resistance, and shows a very slightly bulging, red, firm, slightly bleeding cut surface in which the trabeculæ are more prominent than normal and the follicles very slightly enlarged.

Adrenals—Normal.

Kidneys—Combined weight 340 grams, the right weighing 30 grams less than the left. Left kidney measures 12 x 4.7 x 4 cm., capsule strips with slightly increased resistance, leaving a smooth, extremely pallid, outer surface with slight remains of fetal lobulation, and numerous light and dark red, irregularly defined, non-elevated areas 1 x 4 mm. in size. Organ cuts with normal resistance and shows a bulging, extremely pallid, non-bleeding, very moist, fairly firm cut surface. Cortex averages 6 mm., is pallid and shows a few punctæ like those on the outer surface, no striation and no glomeruli. Entire substance measures 23 mm., pyramids being vaguely defined and of an orange color. Peripelvic fat diminished, pelvic mucosa normal. Right kidney measures 10 x 5 x 4 cm., the cortex averages 5 mm., the entire substance 2 cm.; in other respects this organ is like its fellow. Ureters and bladder normal.

Testicles—Normal.

Liver—Weighs 950 grams. Measures 20 x 15 x 5.5 cm. Organ is firm, shows a smooth, transparent capsule and distinctly rounded edges. Through the transparent capsule numerous small, white, non-elevated nodules about 1 mm. in diameter are to be found. Organ cuts with normal resistance and shows a bulging, extremely moist, slightly bleeding, firm, yellowish-brown cut surface in which the central parts of the lobule are of darker color, the peripheral parts yellowish-gray. Gall-bladder and bile ducts normal.

Pancreas—Grossly normal.

Stomach—Normal except for a few submucous punctate hemorrhages.

Small Intestine—In the upper part of the jejunum there is moderate follicular enlargement becoming less marked in the lower jejunum, and with the approach to the ileum, being combined with slight enlargement of Peyer's patches, the latter extending to the ileocecal junction. In the lower ileum, in addition to the enlargement of Peyer's patches, the follicular enlargement becomes more prominent. Appendix normal.

Large Intestine—Throughout its length shows considerable enlargement of the follicles, in many cases with small central, pin-point-sized areas of pigmentation.

Mesenteric Lymph Nodes—These, as well as the retroperitoneal and pelvic nodes show moderate enlargement, are soft and show a bulging, light-yellow, moist cut surface with small areas of centrally disposed red color.

Tonsils—Moderately enlarged, firm, and in the cut surface have a deep blue color. Tongue normal. Larynx normal.

Bone Marrow—The marrow of the right tibia in the middle of the shaft is creamy red, soft, and shows no fat grossly, and is of fairly firm consistence.

Anatomical Diagnosis—Acute lymphatic leukemia, leukemic enlargement of all lymph nodes, including tonsils, hyperplastic bone-marrow, passive congestion and lymphoma of lungs, fibrosis of pulmonary valve leaflets, chronic interstitial myocarditis, cloudy swelling and fatty metamorphosis and lymphoma of liver, chronic splenic tumor, lymphatic hyperplasia of small and large intestines, acute glomerular nephropathy, hemoglobin stained intima of the blood-vessels.

Microscopical Diagnosis—Passive congestion, edema and hemorrhagic infarction of lungs; advanced cloudy swelling of heart; lymphoma, cloudy swelling and passive congestion of liver; normal pancreas and stomach; lymphoid hyperplasia and infiltration of intestine and colon; passive congestion, leukemic infiltration of walls of large vessels, and follicular hyperplasia of spleen; edema of adrenals; diffuse lymphoma and acute, degenerative or tubular nephritis; lymphoma of testis; acute hyperplasia and lymphoma of tonsil; lymphoma of lymph node; diffuse hypertrophy of bone-marrow.

The above case partially simulates 2 cases of myelogenous leukemia reported, one by Neuman,[1] in which the white blood cells dropped from 56,000 to 5,000 and then to 200, when the patient had an uncontrollable nose-bleed, and died thirty-nine days after the suspension of the benzol and another by Kiralyfi,[2] in which the white blood cells dropped from 73,000 to 33,200 in one week, 2 grams of benzol being given per rectum three times daily. By the sixteenth day the white cells had dropped to 5,000, spleen had decreased in size, temperature had dropped to normal and the patient felt well. The leukocytes continued to drop to 2,800, epistaxis commenced and lasted for seven days, uninfluenced by gelatin or serum. The white cells finally dropped to 460 and the patient died twenty-two days after the suspension of the benzol. While our case did not, with the exception of a slight nose-bleed on October 20th, show any external hemorrhage, yet the autopsy showed a generalized lymphomatous condition of all the organs. From the blood chart it would seem that the critical point of the case was on the twenty-eighth day of the disease when the benzol was increased to minims iv four times daily. From that date to the end, all the curves, with the exception of the polynuclears, began to descend. It would also appear that there is a definite limit in the dosage of benzol which a leukemic patient will tolerate and respond to favorably, beyond which the white blood cells rapidly disappear from the circulating blood. It would be very interesting to know whether at this point transfusion, direct or indirect, might have averted the impending catastrophe. The case, however, is not without some interesting and instructive points.

First—Up to the time of entrance of patient no case had been reported of acute lymphatic leukemia in children in which benzol therapy has been tried and in which an autopsy had been allowed.

Second—The gradual reduction of the white blood cells with comparatively small doses of benzol.

Third—The extreme high temperature at the end, making it resemble a terminal infection.

Fourth—The complete reversal of the picture of the white blood cells as it appears in cases of leukemia not treated with benzol.

Fifth—With the exception of the blood picture there were no other signs of benzol poisoning.

Sixth—As Billings[3] points out, the blood picture, after the administration of benzol, becomes a rather complex one and difficult to analyze.

Seventh—The absence of gastrointestinal symptoms throughout the entire case.

Eighth—The heart murmur, which was thought to be an anemic one, was found at autopsy to be probably due to an endocarditis and an interstitial myocarditis.

Ninth—The gradual ascent of the polynuclears and the hemoglobin.

Tenth—The apparent good results obtained while the patient was receiving benzol minims iii four times daily.

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ACUTE PYELITIS. A CAUSE OF OBSCURE FEVER IN INFANCY

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The most neglected part of the routine examination of infants and young children among the general practitioners is the urine. Every one in this age of thoroughness in medicine suspects the throat and the middle ear until both have been found normal, but the urine as a means of gaining diagnostic information is, as a rule, not considered. This fact seems to hold true also for some of the pediatrists, judging by the way in which urinary disturbances are slurred over or not mentioned at all. We were taught in the medical schools ten years ago that pyelitis was a rare affection in children. If it had been true then, it would probably be true now, so we feel justified in the opinion that acute pyelitis is simply an overlooked disease which is daily coming into prominence, not as one of the rarer causes of obscure fever, but as the most probable cause.

The greater prevalence of acute pyelitis in infancy in my own experience may be in part due to geographical conditions, as we have seen so frequently in such diseases as typhoid, pneumonia and measles. Certain it is that in North Carolina the disease is quite common, though not generally recognized until recently. Another rather notable feature is the fact that it is so often a primary condition and not necessarily the sequela of any of the acute infections, as is so often noted in the few references to it in the literature.

The usual causes of pyelitis, viz., stone, tuberculosis, and a pre-existing cystitis, are all excluded in the group of cases considered in this article. The condition under discussion is due to an infection of the urinary tract, in a large majority of instances, at least, by the bacillus coli communis. It is not yet proven that this organism is the sole cause, but certain it is that it preponderates over all others. It can readily be conceived just what would occur if the organism was a malignant strain of the streptococcus which does occasionally occur. The low-grade character of the colon bacillus gives us every opportunity to see the patient escape with the least possible damage, provided the condition is discovered in due time.

L. Langstein* has found that a culture of the bacillus coli communis from the urine of such a case will be agglutinated by the blood serum of this patient in dilution of 1 to 200. It is usually not necessary to go into any elaborate test in deciding the character of the infection. The myriads of the colon organism which are seen under the field with the one-sixth lens would hardly be mistaken for any other organism under the circumstances.

The source of the colon infection of the pelvis of the kidney is the subject of much difference of opinion. Eisendrath,† referring to the work of Franke, expresses the theory of the migration of the colon organism through the wall of the intestines into the lymphatics which connect the right kidney with the ascending colon. He shows that there are also a number of lymphatic connections between the colon and the left kidney. It is further shown that in such conditions as constipation, enterocolitis and other resistance-lowering causes many colon bacilli enter the mesenteric lymphatic glands and later find their way to the kidney. This same writer, while not minimizing the important rôle which the blood route plays in renal infection, cannot accept it without some reservation. He questions the probability of organisms proceeding upward along the mucous membrane of the ureter from the bladder to the kidney. As he so clearly points out, it has never been a reasonable theory that organisms should migrate against the urinary current except when complete stagnation occurs, and yet this is supposed to be the route followed, especiallly in explaining the greater frequency in female children. It is supposed that the vaginal orifice of the urethra is soiled by the frequent diarrheic stools and that from this point the offending organism begins its long journey against gravity and water current, without shedding its disease properties along the way. Some wise writer has asked the question why, then, in gonorrheal vulvovaginitis of infants does not this same thing occur? Surely urethritis is quite liable to occur, and in the presence of such an urethritis the factors in favor of an ascending infection would be greatly increased. Again, quoting Eisendrath, he says: "Some writers attempt to ascribe many cases of renal infection, especially in children, to such a close relation between the alimentary and urinary tracts. In the absence of any proved clinical facts, it is well to suspend judgment for the present. The same is true regarding the transmission of infection from the female genitalia to the ureter and kidney. For practical purposes the knowledge of the hematogenous and ascending (intraureteral and intramural) modes of invasion suffices."

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* Langstein, L.: "Erkrankungen des Urogenitalsystems in Pfaundler u. Schlossmann's Handbuch der Kinderheilkunde."

† Eisendrath, D. N.: "The Clinical Aspects of Renal Infection." Interstate Medical Journal, XXI., 7. July, 1914.

Sedgwick* and Huenekens failed in an effort to experimentally produce pyelitis in guinea pigs by way of the urethra.

The strongest evidence in favor of an ascending infection is the supposed much greater prevalence of the disease in female than in male patients. This is a point about which there is probably some error. If the urine were suspected in the case of the male as often as in the female it would be more frequently examined, and the result would prove very soon that pyelitis is occurring much more commonly among the boys than is recognized. It is not to be denied now that the majority of cases are among female babies, nor can it be denied that ascending infection from a soiled vulva is sometimes responsible for the disease. It is but fair, however, to conclude that constipation is much more frequently the cause than has been hitherto recognized and that many more cases occur without ascending infection than the literature mentions.

Pyelitis is usually quite insidious and will never be suspected from any symptom in the majority of cases. It should, of course, not be overlooked for this reason, for there is no justification in a failure to examine the urine in every case seen by a physician. It is doubly true of infants, though much more frequently overlooked. The throat, ears and urine should be examined regardless of the occasion of the consultation.

Because the baby is a male is not sufficient reason to neglect the examination of the urine for pus. The 2 following cases illustrate the reason for this statement. It happens that these 2 cases are the last 2 cases of infantile pyelitis seen by the writer:

CASE I. A healthy male baby of fifteen months, who had never been sick and who had always been rationally fed. His mother was intelligent and careful. After a night of fever and restlessness I was called. The child was having a severe convulsion. Rectal temperature was 104.6°. In two hours there occurred a second convulsion. The intestinal tract was promptly washed out and a specimen of urine asked for. The throat, the abdomen, the ears and the chest were negative. The child was apparently in perfect health otherwise and had never had an infectious disease. The urine was intensely acid and there were numerous pus cells and bacteria in every field. It was unnecessary to examine a centrifugalized specimen because of the great number of pus cells readily found. He responded promptly to potassium citrate and made an uneventful recovery.

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* Sedgwick: Journal American Medical Association, LXIII., 21. November 21, 1914. Discussion of the Urinary Analysis by Rowland Godfrey Freeman, M.D.

CASE II. A boy of fourteen months, who had never had an infectious disease and had been rationally fed from birth. He was an unusually fine specimen in every way. He was taken rather suddenly sick. The chest and abdomen were carefully examined and found negative. His ears were examined by an aurist, who found them normal. The temperature reached 105° on the second day. There was no other symptom. The first specimen of urine was acid and contained only a very few pus cells. Evidently drainage was defective, as the temperature subsided more slowly than usual. He made an uneventful recovery after four days' medication with potassium citrate.

Not infrequently acute pyelitis follows an acute infectious process. This is well illustrated in the following case:—

CASE III. The child was a girl of eighteen months, who had never before been sick except with coryza. She had just begun convalescence from a rather severe attack of measles without complications. While still in bed, after the eruption and fever had disappeared, there was a sudden rise of temperature, which reached the point of 104.6°. The urine macroscopically was negative and another cause was sought. The chest naturally was suspected, though in this particular epidemic the bronchopneumonia had occurred invariably at the height of the disease and not in convalescence. The chest, abdomen, ears and skin were negative. Routine examination of the urine revealed the presence of pus cells in considerable numbers. The usual treatment was promptly successful.

CASE IV. A girl of seventeen months, who was recovering from ileocolitis, was seen in consultation. The child was in her carriage and a careful examination was not made. The history showed that after the usual duration of fever with the colitis it did not subside with the subsidence of intestinal symptoms, but rather increased. The child was pale and emaciated. Every day there was a rise of temperature. Not examining the urine I overlooked the presence of pus, which was found by my colleague on the following day. There was an uneventful recovery.

Case V. A girl of fifteen months, who had had a long siege with ileocolitis, was seen in consultation. The predominating symptom was fever and great tenesmus causing frequent bowel movements. The child was quite anemic and seriously sick, presenting all the appearances of an overwhelming toxemia. An examination revealed acid urine full of pus and motile bacilli. There was an uneventful recovery.

Many cases of acute colon pyelitis, queer as it would seem, are mistaken for ileocolitis. This is due to the rectal tenesmus and tendency to diarrhea so often found in the former condition. The following case illustrates the point:—

Case VI. A girl of seventeen months, who, following a digestive upset, had fever, tenesmus and some tendency to diarrhea, was sent to the seacoast in the hope that the change of air would relieve the fever, which was persistent though markedly intermittent in character. The case had been diagnosed ileocolitis and treated accordingly. When I first examined her I found a temperature of 105°, profound anemia and emaciation. This child did what is often seen in these cases, but which should not be emphasized for fear that some might lean on the symptom too heavily: each urination was attended with pain and would awaken her; furthermore, she would turn over on the face and climb up on her knees at the time of voiding. The case was definitely one of colon pyelitis, which promptly responded to treatment directed to the urinary condition. In this case there was never seen an intestinal symptom after the correction of the urinary disturbance.

Acute pyelitis may occur quite early in life. This is well illustrated by the following case:—

Case VII. An infant of five months. A male. When first seen by me he was receiving condensed milk and was suffering from the effects of excessive sugar. He was malnourished, pale, and waxy. Modified milk with low fat was advised. When seen the second time, several days later, it was found that he had fever, which did not impress the mother, who thought he "was subject to it." Careful investigation of the chest, abdomen and throat revealed nothing. Kernig's sign was present. The temperature soon reached 104°. The slightest movement of his body brought forth wails of pain from the sufferer. It was two days before the specimen of urine was brought to me. It was found to contain pus cells and to be quite acid in reaction. Owing to the continuous type of temperature there was a suggestion of typhoid in the curve, but the rarity of this disease excluded it. The fever with the nervous symptoms in a marasmic child further suggested tuberculous meningitis, but lumbar puncture was postponed until after the examination of the urine, when it was not necessary, as the symptoms were explained.

While it is obvious that the kidney stands a great deal of this sort of abuse, due probably to the character of the drainage and the low virulence of the common colon bacillus, still we find that even in this condition there is a limit and the too long delay probably frequently causes a fatal termination. It is probable that this explains some, at least, of the diagnoses of typhoid in early infancy and also a portion of the atypical cases of meningitis.

Case VIII. A female child of eighteen months was brought to the seashore because of a persistent temperature which was said to follow an ileocolitis. The child was marasmic in the extreme and was undoubtedly the victim also of amyloid disease. The urine was asked for, but the diagnosis of pyelitis came too late and the child succumbed. This was the only fatality in the list coming under my observation and this could have been readily prevented if the diagnosis had been made earlier in the disease.

There is a marked tendency for colon pyelitis to recur from time to time. I have now under my care a child of eighteen months who has had no less than five definite and distant attacks. She is a magnificent child in every way and the disease apparently does her no harm, though what the future has in store for her remains to be seen. In this case an outbreak is always immediately recognized by the mother and the citrate of potash is promptly given.

Case X. is cited for another purpose. This patient is a man of sixty-seven years, who for many years has "suffered much at the hands of many physicians" for malaria, manifested by frank rigors, but without the most definite regularity. When I first saw him I was unable to find malaria plasmodia in his blood, but I did find his leukocyte count to be 18,000. An examination of the urine cleared up the difficulty at once. The pus cells were very abundant, as well as the common colon bacillus. The reaction was decidedly acid. The routine treatment, first with alkalies followed by a hexamethylene, was sufficient to cure the "malaria" and also to account for the failure of quinin in the past.

This last case is selected from my series to illustrate that it must not be inferred that this affection is limited to children. A diagnosis of colon pyelitis in an adult must be made with much more reservation than in an infant, but, like the occurrence of the condition in the male child, must not be overlooked. It is always well to consider stone in the adult as the most probable cause of pus in the urine and to exclude it a reliable skiagraph must be made, and even in the event of a negative finding it cannot be too readily dismissed. Tuberculosis of the kidney also comes in for a share of suspicion and is excluded with even more difficulty in many cases.

Vanderhoof,* of Richmond, Va., has done much to attract the attention of Southern medical men to the error being daily made in the confusion of malaria and pyelitis. He shows that it is purely a matter of lack of routine and thoroughness in the examination. Fortunately this condition is rapidly giving way to accurate scientific medicine, and even the patient himself expects to have the parasite found or not found in his blood before the question of his malaria is settled. The old idea of "a touch of malaria" is giving place to the fuller understanding of the disease entity and the necessity for means of precision in the diagnosis.

The treatment of pyelitis in infancy is perfectly simple. It cannot be too strongly emphasized that hexamethylene is not the wonderful remedy here that it is usually thought to be. Holt, in his matchless text book, emphasizes the necessity of rendering the urine alkaline. It is well known that invariably in this condition the urine is intensely acid and it must appear at once that to give the pathogenic microörganisms a medium exactly opposite to that in which they seem to thrive best is only rational treatment. Therefore, potassium citrate theoretically would be indicated. Practically, it is almost specific in its action. The dose given ranges from 2 to 5 grains at two or three hour intervals. James Burnet† says that the use of any other drug is a waste of time and that the use of urotropin is worse than useless, because it can do definite harm to the secreting portion of kidney structure in young children. Long ago I found the utter uselessness of urotropin and have about abandoned it, though occasionally after the attack of pyelitis is entirely over I give it in the same manner as after typhoid for the purpose of rendering the urine sterile. This latter use is more out of respect to tradition, and in my last 2 cases it was omitted. Certain it is that during the height of the disease the drug is utterly useless. Often after employing potassium citrate the temperature falls as rapidly as in the crisis of pneumonia, and it will not rise again if the urine can be kept alkaline. The use of autogenous vaccines theoretically is in order, but in my experience has never been necessary. The prophylactic treatment consists essentially in keeping the bowel function up to normal, always having in mind the possibility of relative constipation. Many mothers report that the child's bowels are normal because of one bowel movement daily without aid, but in such cases I have frequently found that purgation was very necessary. The constipation should be corrected by diet, whenever possible. The use of the culture of the bacillus bulgara alone or in the form of buttermilk should be commended

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* Vanderhoof, Douglas; Journal American Medical Association, LVIII.

† Burnet, James: "Pyelitis: Its Clinical Varieties and Treatment." International Clinics, Vol. IV. Twenty-second Series.

SUMMARY

(1) Acute pyelitis is being frequently overlooked in infancy because of the neglect of routine microscopic urinary examinations in all cases, but especially when there is obscure fever.

(2) While the condition is more frequent in female children, still there are many cases in males which are overlooked.

(3) The theory that acute pyelitis is always an ascending infection with the colon bacillus from the soiling of the vulva is losing its hold and other sources, as infection from the colon by way of the lymphatics, is gaining ground.

(4) Acute pyelitis is often primary and does not necessarily follow one of the acute infections.

(5) Malaria and typhoid are often diagnosed in this condition.

(6) The disease responds promptly to the use of potassium citrate through the rendering of the urine alkaline.

(7) Hexamethylene preparations are most disappointing and their use is to be questioned in infancy.

201 Chestnut Street.

TWO CASES OF PARAPNEUMONIC EMPYEMA IN CHILDREN.

BY L. W. SAUER, M.D.

(From the Otho S. A. Sprague Memorial Institute Laboratory of the Children's Memorial Hospital, Chicago.)

Gerhardt recently published 5 cases of parapneumonic empyema in adults. We wish to report 2 cases occurring in young children. A brief outline of our cases is as follows:—

Case I. Stephen K., four years old. The patient was admitted on February 1, 1914, having taken sick suddenly the previous night with vomiting, coughing and fever. The child is well nourished, breathes rapidly with an expiratory grunt. There is dullness over the right lower lobe, where the breath sounds seem distant. Coarse and fine râles are heard over both lower lobes. The temperature is 40.2°C. (104.4°F.). The dullness is more pronounced, but there is no distinct tubular breathing that evening.

February 20th. The dullness is more pronounced, has spread upward and includes the middle lobe. There is distinct tubular breathing. Thoracocentesis in the seventh intercostal space in the mid-axillary line yielded a few drops of pus which contained leukocytes, epitheloid cells and some Gram-positive diplococci.

February 21st. Repetition of the puncture gave 7 c.c. of slightly blood-tinged, creamy pus, which contained many Gram-positive capsulated diplococci, easily cultivated in pure culture.

February 23d. Crisis; the dullness in the right axilla is more pronounced, the breath sounds are decreased, prolonged and tubular.

February 27th. The dullness in the right axilla is more pronounced, whereas it is less marked in the region of the right lower lobe. The breath sounds in the right axilla are distant.

March 1st. The percussion note over the right lung is now quite normal, so are the breath sounds. The temperature is normal; attempted aspiration at the site of the previous thoracocentesis now without result. The patient is rapidly recovering.

Case II. Stewart C., three years old. The child took sick suddenly March 3, 1914, with cough and fever. The respirations were 50 per minute, the temperature 39.4°C. (103°F.).

March 4th. Dullness over the right lower lobe, with bronchial breathing over its upper part; nasal discharge and reddening of both drum membranes.

March 5th. Dullness over the left lower lobe up to the scapula, with bronchial breathing over an area in the left axilla, and decrease in the breath sounds in the lower part. There is a flat percussion note over the right lower lobe, also distinct bronchial breathing.

March 6th. The dullness of the right side has spread to the anterior surface, where it reaches up to the fourth rib. The breath sounds are distant.

March 7th. Aspiration in the eighth intercostal space in the posterior axillary line, whereby about 0.5 c.c. of pus was obtained. It contained leukocytes, but no microörganisms; cultures were sterile.

March 8th. Dullness over the right lower lobe less pronounced, friction rub on deep inspiration, paracentesis of both drum membranes.

March 12th. Dullness, and bronchial breathing over the left lower lobe, no discharge from ears, paracentesis with discharge of blood-tinged serum.

March 13th. Lung findings as before, left ear is discharging, the temperature is normal. No further complications; the child makes a perfect recovery.

An empyema, developing in the course of a pneumonia, has been reported by French and German authors. The French have divided the parapneumonic empyemas into two groups—the fulminating and the benign. The former are usually fatal in spite of surgical aid; the latter recover spontaneously without it.

As far as could be ascertained no cases of the benign type have been reported for infants or young children.

Gerhardt points out four characteristics of benign parapneumonic empyemas:—

(1) Pus develops early in the fever stage of the pneumonia.

(2) The course is benign, *i.e.*, the temperature—and pulse—curve and the duration of the pneumonia are unaffected.

(3) There are usually no microörganisms in the pus.

(4) The amount of pus is small.

In 4 of the cases cited by Gerhardt about 1 c.c. of sterile pus was obtained; in the fifth there was somewhat more pus and it contained Gram-positive, capsulated diplococci, cultures of which, injected into mice, proved to be avirulent. He says that cases which contain the microörganism in the pus (as his fifth and our 1st) prove that the pus need not be sterile primarily and most likely is not, but becomes sterile later. According to him the virulence or avirulence of the microörganism decides the prognosis.

The benign, parapneumonic empyema is, doubtless, not very rare. Our cases were observed since Gerhardt's publication appeared, and we heard of a case in a child where a trial aspiration during the height of the pneumonia gave pus, but the child recovered without surgical interference.

Our first case shows very strikingly how little the picture of the pneumonia is affected; also that pus is present within sixty hours after the onset of the pneumonia. Bearing the seriousness of empyemas in young children in mind, it becomes especially important to lay stress on the benign character of the above-described type of parapneumonic empyema, and to warn against hasty surgical interference. Although pus in the pleural cavity means surgical measures to many, we feel certain that such measures are not necessary in the above-described type.

NOTE.—The literature is well reviewed in Gerhardt's recent article. No other cases could be found, although a few remarks were found on the subject of parapneumonic empyema in general. (Gerhardt, *Mitteil. aus d. Grenzgeb. d. Med. u. Chir.*, 1913, Vol. XXVI., p. 5,695.)

VALUE OF EXTERNAL HEAT TO ILL BABIES—(Guy's Hospital Gazette, London, September 12, 1914.) A method of maintaining external warmth of a baby whilst allowing it fresh air to breathe is now adopted in Guy's Hospital. A blanket covers the infant to the neck. The face is exposed to the ordinary fresh air of the ward. A small cradle being placed outside the blanket covering the child's body, within the cradle are hung some ordinary electric lights. The cradle is covered with one or more blankets, which are well tucked in around the bed. The electric switch is turned on, and the temperature within the cradle watched by means of a thermometer. This treatment is most beneficial in marasmus, diarrhea, vomiting with a tendency to collapse, ordinary bronchitis without high fever, and in many other similar conditions. The heat loss prevented by it does much to hasten recovery of the patient. This treatment is contraindicated in conditions of high fever.—*The Modern Hospital.*

A CASE OF BELL'S PALSY*

BY MARTIN J. SYNNOTT, A.M., M.D.
Montclair, N. J.

We have all, no doubt, seen varying degrees of paralysis of the terminal branches of the seventh or facial nerve in newly-born infants following the use of forceps or from pressure or trauma during birth.

But a case of peripheral facial paralysis, or "Bell's Palsy," involving all three branches of the facial nerve, occurring suddenly and without discoverable cause in a young child is, I think, sufficiently rare and interesting to justify me in reporting it.

Case—M. B., aged six years; adopted child; antecedents and family history unknown. Had been operated for adenoids two years ago. Last May had fainted, following a slight fall, while narrating the incident to foster-mother. This is mentioned as showing a tendency to vasomotor disturbances. She was brought to my office on October 22, 1914, because her foster mother noticed "her face was drawn to one side." The preceding morning she had been badly frightened by a cow, and at dinner, an hour or two later, her mother noticed something peculiar about her expression, and reprimanded her for "making faces." Later in the day she experienced some difficulty in chewing her food, and that night, when asleep, it was noticed one eye was only partly closed. On examination, while the facial muscles were in repose, I found no symptoms, except that the paralyzed side seemed full, smooth, and gave the impression of being somewhat swollen. But when the muscles were called into action, as in talking, eating or laughing, the whole right side of the face was at once seen to be paralyzed, the mouth being drawn to the other side. The paralysis included all the muscles of the forehead, those about the eye, cheek, nose and mouth on the affected side. The child could not wrinkle the smooth forehead, contract the eyebrow, frown, close the eye completely, dilate or raise the nostril, pucker the lips, whistle, blow, or "make a face." In other words, all the muscles of expression supplied by branches of the seventh nerve on the affected side were paralyzed. In eating, food collected between the teeth and gums from Buccinator paralysis, causing some difficulty in deglutition. There was no deviation of the tongue. The Wassermann reaction was negative, and the leukocyte count 13,000; temperature normal; child well nourished and healthy.

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* Read before the Clinical Society of the Mountainside Hospital, Montclair, N. J., December 3, 1914.

The physical examination was negative except that the tonsils were enlarged and uneven of surface, but not diseased. The ear on the affected side had a collection of hardened wax in it, but when this was removed the drum membrane appeared quite normal. The parotid gland was not enlarged.

Diagnosis—In diagnosing this case as one of "Bell's palsy," or peripheral paralysis of the seventh nerve *after* its exit from the stylomastoid foramen, it was of course necessary to exclude, first, a central brain lesion, and, second, some damage to the nerve in its passage through its bony canal in the petrous bone. This was was not difficult.

(1) If the trouble had been due to some central cause within the cranium, such as a blood clot from meningeal hemorrhage, basilar meningitis, or intracranial tumor pressing on the nerve before its entrance into the internal auditory meatus, the child would have had also a hemiplegia, some affection of the auditory nerve, and a paralysis not of all three branches of the seventh nerve, but of only the lower half of the face—the muscles of the forehead, and those about the eye, particularly the orbicularis palpebrarum, escaping. In this case there was complete peripheral paralysis, showing that all three branches of the seventh nerve were affected, thus proving that the lesion was in the trunk of the nerve. Furthermore, the reactions of degeneration were present with diminution in the response to faradic current, as was to be expected; whereas, with a central lesion, the electrical reactions remain the same as in health. This would also exclude a very small cortical hemorrhage which might produce a paralysis of the face only without hemiplegia.

(2) In the bony canal the facial nerve is usually inflamed as a result of some chronic form of disease of the ear with caries of the petrous bone, which is very often tuberculous, although it occurs occasionally with acute otitis. In such cases there would be a history of a purulent discharge from the ear or of some middle-ear trouble, and generally some deafness on the affected side—and if the nerve was diseased between the stapedius and the geniculate ganglion, a disturbance of the sense of taste in the

anterior part of the tongue, and in the secretion of saliva, due to involvement of the chorda tympani. None of these symptoms were present—the child could recognize the difference between bitters and sweets, acids and alkalies. The mouth was moist, showing that the salivary glands were secreting, and the sense of hearing was not affected, showing no paralysis of the stapedius.

Facial paralysis may also occur as a result of injury to the nerve during the mastoid operation, and as a result of fracture of the base of the skull, both of which were readily excluded in my case.

Prognosis—This depends of course on the severity of the disease, and may be gauged by the extent of the paralysis of the orbicularis palpebrarum. In severe cases the eye remains open on the affected side, even in sleep, and resists all attempts at closing. In this case the eye could be partly closed, and I have therefore given a favorable prognosis, taking this to indicate that the paralysis is of only moderate severity.

Etiology—The most common cause of neuritis of the facial nerve, outside of injuries inflicted during delivery, is exposure to cold, but this was absent in my case; it may occur as a complication of mumps or as the result of disease of the lymph glands of the parotid region.

In this case naturally we associate the onset of the paralysis with the severe fright the child had a couple of hours before. This may have been merely a case of *"post hoc propter hoc,"* but the fact that I could find no other causative factor made me wonder whether a severe vasomotor disturbance caused by the fright might not have produced some sudden hyperemia in the nerve trunk that would affect in some obscure way its nutrition and cause the paralysis.

Treatment—The only treatment advised during the first ten days was to protect the eye, keep it clean, and to apply counter irritation daily with mustard, over the nerve at its exit from the stylomastoid foramen behind the ear. Since that time I have been using electricity and massage regularly and systematically. The muscles respond to the faradic current, so I am using that, otherwise I should employ galvanism. This I expect to continue until the child has recovered, which I hope will be in a couple of months.

SOCIETY REPORT

FIRST MEETING OF THE CALIFORNIA PEDIATRIC SOCIETY

December 9, 1914

William B. Lewitt, M.D., Chairman

president's address

Dr. Lewitt—Through the efforts of Dr. William P. Lucas, a meeting of a few members of the profession who are interested in pediatrics was held on October 8th, and measures taken for the formation of an organization to be known as the *California Pediatric Society*. Officers were elected and a constitution and by-laws adopted.

I was unable to be present, so I want to take this opportunity to thank those who were at the meeting for electing me to the office of President. Such action was entirely unexpected, and is most sincerely appreciated.

The name of the Society—The California Pediatric Society—indicates that its activities and functions are not to be entirely local. It is the hope of the founders to create, if possible, a State-wide interest in this work. With that idea in view, preliminary steps have been taken toward the formation of a similar organization in the southern part of the State, to be known as the Southern Branch in contradistinction to this, the Northern Branch, it being the idea to hold, if possible, joint meetings once a year, alternating between the two sections of the State.

As you all know, any physician registered in California may apply for membership, and the Secretary has endeavored to get in touch with physicians in the interior who would be apt to take an interest in the work of the Society. In fact, it is sincerely hoped that the membership will be general in character; not confined to those interested only in pediatrics, but will include those whose work lies along other lines.

It is possible that affiliations with some Eastern Society may be brought about.

Certainly, from the number and personnel of those present, we have every indication of a successful future. So now as President I bid you welcome.

SOME SOURCES OF ERROR IN THE DIAGNOSIS AND TREATMENT OF LOBAR PNEUMONIA IN CHILDHOOD

Dr. E. C. Fleischner, of San Francisco, read this paper. (See p. 165.)

Dr. R. M. H. Berndt—I am very much impressed with the rational and common sense remarks which the doctor has brought out in his paper and every intelligent physician should fully coincide with him, especially in reference to treatment. Unfortunately we have many of these cases to treat at home, and I would be pleased if the parents of our patients could have listened to the doctor's paper. A physician treating such a patient at home is handicapped, as he has to listen to, and very often must be influenced by, the neighbors and the old women in the neighborhood or the friends of the people, so that he under this pressure sometimes has to yield to the application of remedial agents which he would not apply when unhampered and more or less forced to please others. Also people would not press the doctor so much in reference to diagnosis if they could know the difficulty of making it in some of the cases. People are inclined to look at the doctor as incompetent if he is not able to make a diagnosis immediately.

Dr. H. H. Yerington—I was very much interested in Dr. Fleischner's paper. I think that any of us who have seen a good many cases—especially in hospitals—will agree with him that the majority of cases we see in babies are what we call a central or root pneumonia. I do not think there is anything more discouraging than to see an infant come into the hospital with a leukocyte count of 33,000, temperature 104° or 105°, and, after going over the case, find absolutely nothing on physical examination. This occurs in many cases of early pneumonia. The case runs along possibly three or four days; as he says, the first symptom you find in the chest is diminished breathing. This goes on for a few hours and in a short time typical signs of pneumonia will come out. Oftentimes we have cases which have been sick three or four days come to the hospital with very few chest signs;

the next day the child has a crisis and the diagnosis of pneumonia is made at that time.

I was very much impressed with what Dr. Fleischner had to say in regard to the treatment of pneumonia in children. I think the majority of cases we see are certainly over-drugged. Fresh air and feeding are the most important things in these cases and the administration of drugs ought to be left to the time of the crisis. If these cases need drugs, that is the time to give them. As he says, most of these cases are so thoroughly drugged by the time they are admitted that when the crisis comes helpful drugs have little effect.

I am sorry this paper could not have been read in some parts of our city and county where the use of the so-called pneumonia-jacket and chest applications are so prevalent and drugs so freely given.

Dr. T. C. McCleave—This paper is so excellent it seems to me that it should elicit a great deal of discussion, although Dr. Fleischner leaves little else to say. One can but confirm almost everything he has said; but in the matter of percussion—of which he spoke briefly—I am sorry he did not emphasize its importance more than he did, because I think there is a grave source of error in percussing these pneumonia cases—most physicians go at it exactly as in percussing the chest of an adult, and if there is anything which will give you fallacious results, it is that. The percussion of a child cannot be too light; anything above the lightest percussion will frequently lead you to overlook what under light percussion would be evident.

I think no point is more important than this with children with pneumonia or any other condition in which you are attempting to percuss out an area denser than the surrounding tissues. In percussing, as I have described, these areas will be found much more frequently than Dr. Fleischner's remarks would lead one to expect. I know that he percusses properly, but most physicians do not.

Since Pottenger announced his method of eliciting muscle spasm over inflamed areas, I have been much interested in this method of detecting tuberculous and pneumonic areas in the lung merely by the feel of muscles overlying them, and, although my fingers are not educated to it, I am convinced that it is valuable in children. You will frequently find the muscle spasm described by Pottenger and get the sense of resistance to lightly pressing fingers. This confirms what Dr. Fleischner suggests, that nature puts the inflamed lung at rest. So the muscles overlying an inflamed area are rendered quiescent, and this can be made out by the examining finger.

Dr. Fleischner spoke of the prolonged cases. I distinctly recall an interesting case in which the child had a typical lobar pneumonia which failed to clear up; the temperature continued to reach 104° daily for four or five weeks, finally cleared up as Dr. Fleischner suggested. However, in these cases of prolonged rise of temperature over a considerable period of time, I have found it most important to examine the ears carefully. I have had cases in which I have even called in an aurist who has claimed that there was no occasion for puncture, but having insisted upon it, and having found only a drop or two of bloody serum, after such puncture the child has recovered without further symptoms, showing that so slight an infection of the middle ear in a baby may keep up the temperature for a long time. No harm is done by an exploratory puncture of the ear drum.

I saw a most interesting case of pneumonia some months ago in consultation with Dr. Simpson, of Berkeley. The patient was a very robust, well-developed girl of twelve, who was apparently moribund and it looked as though she could survive at most only a few hours. The most striking thing was the tympanites; the abdomen was tight to a degree I have never before seen. It was evident that she would die. It occurred to me that in a postoperative surgical case the surgeon would never hesitate to go in and allow the escape of the gas which was causing such tremendous distention. So I suggested that this girl's abdomen be opened and either an enterostomy or colostomy be done. This was done under local infiltration anesthesia. It happened that the ascending colon presented, an artificial anus was made, and the immediate relief was very great, large amounts of gas and liquid fecal matter escaping. The girl recovered absolutely as a result of that procedure. I am not aware of a colostomy or enterostomy having been done in a medical case for such a condition as I have described. If it is logical in postoperative surgery, surely in a case of pneumonia, where we find so extreme tympanites, enterostomy or colostomy is thoroughly justified, as the result proved in this case. This girl had a long convalescence, with empyema, but finally got well.

Dr. Florence Sylvester—I would like to ask what experience Dr. Fleischner, or any one else here, has had with leukocytic extract in pneumonia. In the last six months I have used it several times, and it seems to me that the toxemia, difficulty with breathing and also the temperature are more quickly reduced than by ordinary hygienic measures alone.

Dr. Fleischner (closing discussion)—I have never used leukocytic extract. I have only to say that I think cases of lobar pneumonia in both infancy and childhood usually get well. If they are left alone and properly cared for most of them recover if there are no complications.

MORBIDITY AND MORTALITY OF THE ASSOCIATED CHARITIES FEEDING CLINIC, SAN FRANCISCO

Drs. Florence M. Holsclaw and Anna E. Rude presented this paper. (See p. 181.)

Dr. Adelaide Brown—I would like to emphasize one point—in the last year the number of mothers with their own children coming to the clinic for care has increased. These women are not of so high a type as the foster mothers, hence such statistics are even more remarkable. This emphasizes to all of us that the mother does not live who cannot be intelligent if we try to teach her to be intelligent. The average obstetrical care of a woman begins when she calls a doctor and ends at the end of ten days in thousands of cases; but the woman knows very little, and unless the baby has some subsequent supervision the death rate will continue as it is. The mothers with their own children bring their babies in every Friday also. It is a social event in their lives, and the comparison does a great deal.

Dr. E. C. Fleischner—I hope Dr. Holsclaw and Dr. Rude will present this thing before the American Medical Association next year. I know of no better work that has been done, and I am sure the American Association for the Study and Prevention of Infant Mortality would be most interested in these statistics.

It is perfectly astounding the way the mortality has been reduced; and in this connection I cannot refrain from mentioning the value of the certified milk; when these children were fed on ordinary milk and condensed milk there was an enormous number of deaths from tuberculosis. This was reduced most markedly after certified milk was given to the children.

The Association of Collegiate Alumnæ is to be more than congratulated—it is to be commended.

Dr. Holsclaw wondered before we came in to-night if we would be interested in the figures she had to present. We are more than interested, we are enthusiastic over the way this piece of work has been done.

THE DIETETICS OF ECZEMA

Dr. George D. Lyman, of San Francisco, presented this paper. (See p. 175.)

Dr. Douglass W. Montgomery—Eczema is always an interesting subject, but it is too large; even the dietetics of it are too large. In the first place, eczema is not a disease, it is a symptom. It has been truly said there is no such entity as eczema; there are only eczematous people. It is a symptom and a symptom of a vast variety of things. The doctor in the paper has considered a number of those eczema incitants, and it would be exceedingly interesting if in the future the doctor would take up each incitant in a separate paper. This would limit the subject definitely to manageable proportions. For instance, it would be interesting to take up milk fat as a cause of that catarrhal inflammation of the skin we call eczema.

A case mentioned in a recent paper by Dr. Adelaide Brown was very interesting in respect to the connection between an excess of milk fat and eczema. An infant under her care was suffering from severe generalized eczema. An examination of the mother's milk revealed 12 per cent. milk fat (Babcock). Under proper dilution of the milk the eczema cleared up.

The way milk fat acts in causing a catarrhal inflammation of the skin is not quite clear. In fact, there is no reason to suppose that it always acts in one definite way, as milk fat is composed of a great number of different fats, each having its own rate of absorption and its own manner of comporting itself. We do know that it turns rancid easily, and that when it does it has a strong butyric odor. It may be that the glycerin splitting from the butyrate of glycerol leaves enough butyric acid to irritate the alimentary canal and the skin. In adults who consume much butter, and who suffer from seborrheic eczema, there is often a strong odor of butyric acid to the skin. Even butyl alcohol might be formed, which is, of course, much more poisonous than propyl, ethyl or methyl alcohol. It is a chemical law that the more carbon atoms an alcohol has the more poisonous it is. The single exception to this is ethyl alcohol, which is less poisonous than methyl alcohol. The reason for this exception is that we have become accustomed to the use of ethyl alcohol. Even small quantities of butyl alcohol, therefore, might be exceedingly irritating to an infant.

Eczema, when due to dietetics, is, according to my experience, more frequently due to either fat or carbohydrate than to the nitrogenous elements of food. Even when the eczema is due to anemia it resolves itself finally into a fat or carbohydrate problem. When anemia is present the intake of O_2 is necessarily meager, and the fat and carbohydrate undergo an insufficient combustion and cause trouble.

The work of Czerny in elucidating his status exudativus is very important in its bearing on the question of eczema. It is associated with a watery condition of the tissues. I have had a number of infants who were receiving altogether too much liquid in their food. They were "wet" babies. With a diminution of the intake of water the eczema cleared up.

Nature put into milk a slowly diffusible sugar, one of the least diffusible of all sugars, lactose. It is not only slowly diffusible, but it has to be split into galactose and glucose, and therefore resembles starch, that also has to be split into far simpler elements in order to be utilized in the human economy. Nature could not employ the insoluble starches in milk, so she chose lactose. We must remember this when we prescribe glucose or saccharose to infants. It is my impression, however, that troubles incident to the digestion of the carbohydrates are far less frequently incitants to eczema than those due to fat.

The subject of cutaneous catarrhal inflammation in infants, though complicated, is much simpler than in adults, and our hope for the elucidation of this subject rests with the pediatrists.

Dr. E. D. Chipman—It seems almost folly to go into a pediatric society and state that one thinks the question of diet is given too great consideration in the treatment of infantile eczema, and Dr. Lyman said at the outset of his paper, very frankly, that his remarks only pertained to eczemas of internal origin. Nevertheless, while the question of diet must enter into any case of eczema, I am convinced that it is given too much importance. It is so easy to say: "Examine the stools and correct what you find wrong and the case gets well." In 99 cases out of 100 we are disappointed in the findings of these examinations, and the cases do reasonably well on purely local treatment. We are prone to overlook the external causes of eczema. The first reason is anatomical; it lies in the structure of the skin, with its loose construction and inherent fineness.

We know that if a child gets an irritation of the skin a pustule forms ten times as quickly as on an adult, for the infantile skin is more susceptible to external irritation and more liable to reaction from any of a multitude of causes. Most children are overdressed just as they are overfed, and the increase in perspiration results in maceration of the skin with corresponding vulnerability.

It seems strange that one should speak of carbohydrates and fats as causes of eczema. In adults my first thought is to limit proteid intake. To my mind, milk is good food for the eczematous, particularly if somewhat diluted; and the ideal diet is rice and milk, because it is non-stimulating and low in protein. If milk disagrees it is not because of its fats or carbohydrates, but because it is in a bad condition or fed in excessive quantity. I must disagree with Dr. Montgomery on the question of butter fat. I see eczemas getting well on milk and rice diet, and I fail to see any ill effects from butter fats. While the diet of an eczematous child should always be carefully supervised, possibly we lay too much stress on feeding and overlook many external causes which should be taken into account.

DR. VIVIA BELLE APPLETON—Everyone has omitted to notice the fact that eczema is sometimes a serious condition in that there are cases of the exudative diathesis type which meet with sudden death and we must consider these as something more than a mere skin affection.

I agree with those who have spoken of skin lesion as a symptom rather than a disease. These cases nearly always have the mucous membrane as well as the skin affected. They are very apt to have bronchitis and indigestion, and the latter may even be looked upon as a symptom rather than an etiological cause.

Cases treated only with local treatment often have great relief, for as soon as the skin is covered the whole clinical picture changes, because the child is comfortable, but I have never seen a case in which the lesion was really cured except by changes in the diet.

Dr. H. H. Yerrington—I think we all know that a good many babies will stand a high percentage of fat and others will not; this is true with proteids and carbohydrates. In eczema you have to treat the individual baby, and the only way to get at it is to treat the skin locally as well as the dietary condition of the child. The dietary condition is certainly important, because you meet a good many cases where simply putting the child on skimmed milk causes the skin to clear up without any local treatment at all. Local treatment, of course, is indicated, as it dries up the eczema and, most important, adds to the comfort of the child.

Dr. Lyman (closing discussion)—I think in the discussions the important thing mentioned is to know the baby and examine the stools. As Dr. Yerrington said, you have to treat every baby differently and regulate your diet according to information obtained from an examination of the stools. It is my belief that local applications will accomplish nothing without proper attention being directed first to the food and its digestion.

Scrofuloderma in Childhood—K. Bahr (Monats. f. Kinderhk., 1914, Bd. XII., Nr. 12) tells us that tuberculosis in the first years of life is singularly fatal; in 69 children having tuberculosis Halin found a mortality of 83 per cent. With cases of skin tuberculosis the prognosis is better. Scrofuloderma, although local, depends on an infection of the blood, and hence should be as fatal as other forms. The author gives histories of 5 cases observed by him, all of whom were between six and twelve months of age, and all of whom were cured and remained without evidences of tuberculosis two and a half to three years after treatment. Only one of them received a specific or a special fresh-air treatment. Where there were cutaneous abscesses they were opened and injected with iodoform-glycerin. Therefore 4 of the cases showed spontaneous healing. Thus we see that scrofuloderma in early life is often benign.—*The American Journal of Obstetrics.*

DEPARTMENT OF ABSTRACTS

ORIGINAL CONDENSATIONS OF CURRENT PEDIATRIC LITERATURE
BY THE EDITORS AND THE FOLLOWING ASSOCIATES

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COLE, LEWIS GREGORY: THE DIAGNOSIS OF POST-PYLORIC (DUODENAL) ULCER. (The Lancet, London, May 2, 1914.)

This article deals solely with the method of diagnosing post-pyloric ulcer, and, with one or two exceptions, all of the illustrations have been proven by surgical operation. Evidence has now been assembled to show that the portion of the gastrointestinal tract which was previously called the first or ascending portion of the duodenum is not a part of the duodenum at all, but really belongs to the stomach, and the name cap of the stomach has been applied to it. The term post-pyloric ulcer, or ulcer of the cap, should be substituted for duodenal (ulcer) and is so used in his article. Radiology has played an important part in the medical and surgical diagnosis of this condition. There have been many communications from various parts of the world having a direct or indirect bearing on the diagnosis of these ulcers. Two methods have been employed—one is based upon the symptom-complex, or clinical manifestations, some of which have been recognized by radiography; the other method depends on the contention that bismuth will adhere to the ulcer or lodge in its crater. The technique of serial radiography depends upon the rapid and instantaneous photographing of different cycles and different phases of one cycle of the stomach's action. While the progress of the peristalsis may be seen in all cases, Dr. Cole has described a much more complicated gastric motor phenomena, which is like the heart's action and takes place in cycles marked by periods of systole and diastole, or a contraction and relaxation of all the peristaltic ways simultaneously. The period of systole consumes seven-tenths of the gastric cycle and the remaining three-tenths of the cycle are consumed in diastole when the pyloric sphincter closes and prevents the chyme in the cap from dropping back into the stomach. Dr. Cole calls attention to the fact that there is no evidence of periodical opening and closing of the pyloric sphincter independent of the gastric cycle. The cap, which he so ably shows in his pictures, acts, he believes, as a reservoir where the finishing touches of gastric digestion may be applied to the small amounts of chyme, thus isolated from the bulk of the food in the stomach. The method he employs in diagnosing post-pyloric ulcer is based upon the examination of some 500 cases, and recognition by means of serial radiography of a constant deformity of the cap caused by the induration or contraction surrounding the crater of an ulcer, or resulting therefrom. His findings are of extraordinary value. He calls attention to the fact that when one or two, or a dozen radiographs are used they may lead to error and sometimes reflect discredit on this method of diagnosing. The induration of an ulcer may be seen projecting into the lumen of the cap, causing a displacement of the bismuth, which is as constant as one's finger prints in a ball of putty. On the other hand, it may be so small as to present only a dent on the side of the cap, or the process may involve such a large area as to obliterate one-half of the cap without changing or distorting the other half. A positive diagnosis between post-pyloric ulcer and adhesions of the cap from gall bladder infection cannot always be made exclusively from the radiographic findings. Gall-bladder infection usually presents a more extensive involvement of the pylorus and cap or may involve the greater curvature and draw the stomach to the right, causing an angulation of the cap. This article is well illustrated and a careful reading of it would be beneficial.

R. D. M.

JUNOR, KENNETH F.: TWILIGHT SLEEP IN THE HOME. (Medical Record, January 23, 1915, p. 146.)

The author claims that in our modern, highly strung women, among whom childbirth is no longer a really natural function, nature has to receive aid. The very best aid and preventive of the immediate nervous shock of a difficult labor he believes to be twilight sleep. In regard to its danger he points out that from many thousands of cases not more than 0.5 per cent. of deaths have occurred—less than among ordinary labor records. The author's own experience convinced him that the interference with circulation incident to the old method must be obviated. He therefore advocates the addition of sulphate of spartein. This drug, acting as a dieuretic and heart tonic, has the specific effect of equalizing circulation there by preventing flushing in the mother and cyanosis and suffocation in the child. It reduces narcosis amnesia and unconsciousness, permits analgesia to the abolition of any suffering, and secures such a complete reduction of shock that the patient emerges without exhaustion or impaired vitality. The author's most recent case was given a grain of spartein sulphate, 1½ c.c. of scopolamin, and 1 c.c. of narcophan. The anesthesia and amnesia was not carried to an extreme. No complete abolition of the suffering accompanying childbirth was attempted—simply an amelioration, chloroform being used as an adjuvant.

H. R. M.

LAVIALLE, P.: CALORIMETRIC STUDY OF INFANTS. (Congrés National de Fécamp, 26 Mai, 1912, p. 79.)

Lavialle has built a calorimeter upon the lines of the D'Arsonval instrument to enable him to study the irradiation of heat from infants. He reaches the following conclusions: (1) The loss of heat increases with the weight and with size of infant. (2) The loss of heat, in proportion to the weight, decreases following increase in weight, that is, the loss decreases the smaller the relative surface of the body becomes. (3) An ordinary hood prevents loss of about 50 calories. (4) Bare legs cause a loss of 160 calories and bare arms of 40 calories. The author recommends that infants' food be adapted to surroundings and temperature.

C. D. M.

FERET, P.: INDICATIONS FOR WEANING. (Thése de Paris, 1912, No. 291.)

Every infant requires a certain amount of iron for development and usually draws upon a reserve in the liver. After a while the mother's milk does not supply this iron, neither does modified cow's milk. Therefore, when a baby is to be weaned the diet best adapted is one of broth, beef juice and yolk of egg. The time for weaning is not by any means fixed, but it ought to take place by the time the reserve iron above mentioned is failing. In healthy children, breast-fed, weaning should begin at the ninth month, in those artificially-fed somewhat later. Children of tubercular or syphilitic families should be weaned about the fifth month.

C. D. M.

ZAHORSKY, JOHN: OBSERVATIONS ON THE PRODUCTION OF IMMUNITY BY THE TONSILS AND ADENOIDS IN CHILDREN. (Journal of Missouri State Medical Association, December, 1914, p. 255.)

In this article the author cites cases which show decidedly harmful results due to removal of adennoids and tonsils in young children. Other cases are described which show that the early removal of these lymphoid structures did not protect the individual from the usual sequence of events for which their removal is advocated. From his observations he propounds the following theories: (1) Acute infections of the tonsil with a normal reaction rapidly immunize the body against a variety of infections and thereby protect the bronchial tubes and lungs. (2) Hyperplasia of the lymphoid structures of the nose and throat which does not react in attacks of acute infection does not show any marked influence on the production of immunity to respiratory diseases. (3) Hyperplasia of the lymphoid structures of the nose and throat, attended by recurrent attacks of inflammation, not exudative, show a defective immune-producing power of the body.

E. F. W.

FRIEDLANDER, ALFRED: THE EARLY RECOGNITION OF WHOOPING-COUGH BY THE COMPLEMENT DEVIATION TEST. (Lancet-Clinic, January 2, p. 8.)

Statistics quoted by the author emphasize the importance of closer supervision and isolation of whooping-cough cases. Estimates in the year 1906 show that there were 10,000 deaths from whooping-cough in the United States. In Philadelphia, from 1903-1908 inclusive, there were 1,302 deaths from whooping-cough, 1,054 from measles and only 784 from scarlet fever, or almost twice as many due to whooping-cough as to scarlet fever. The author states there is very little being done by physicians, health authorities and sanitation to control the spread of whooping-cough. New York, Philadelphia, New Orleans and

Cincinnati are the only cities which have special wards for the treatment of whooping-cough.

The author in collaboration with Dr. E. A. Wagner has modified the complement deviation test so as to get the reaction in the earliest stages. They used the Noguchi hemolytic system. The antigen is prepared from fresh cultures of Bordet-Gengou bacilli grown on ascitic fluid agar for seventy-two hours. Only fresh active serum and fresh active antigen are used, and for each test a standard emulsion of washed live bacteria. They succeeded in getting positive reactions in the catarrhal stage in thirteen out of fourteen tests. They never failed to get a positive reaction in any case of whooping-cough in the paroxysmal stage. Vaccine therapy commenced early gave very gratifying results. Doses of double the ordinary strength are required. Health boards are urged to incorporate the test as part of their routine laboratory work in order to control the incidence of this serious scourge.

E. F. W.

FREEMAN, ROWLAND G.: CIRCUMCISION IN THE MASTURBATION OF FEMALE INFANTS. (American Journal of Diseases of Children, August, 1914, p. 144.)

The author draws the following conclusions: The masturbation of female infants occurs in nervous children, the stimulating cause being adhesions about the clitoris such as exist in practically all female infants. The treatment of this condition by braces, hygiene, and the improvement of the general health is palliative and not curative. The only curative treatment is by separation of the adhesions and circumcision, and the result of such operative interference is often satisfactory.

H. R. M.

FREEMAN, ROWLAND G.: THE REDUCTION OF INFECTIOUS RISKS IN SCHOOLS. (The Transactions of the Fourth International Congress on School Hygiene, Buffalo, N.Y., August, 1914.)

The author emphasizes the fact that schools are the most important agency in the spread of contagious diseases and by charts he shows the incidence of certain contagious diseases in both America and England in relation to the school year. Most of these diseases begin to spread as soon as the schools open and have their greatest incidence during the latter part of the school year. Diphtheria, measles and scarlet fever reach their highest point in April, when open windows and better ventilation diminish their frequency. Whooping-cough for some reason does not follow the same curve, showing a higher mortality in the summer. While it is probable that, so long as these diseases are so prevalent, all children must have them, it is certain that their incidence can be reduced by taking certain measures in the schools. There is now little doubt that all the common contagious diseases are in reality sputum diseases, which are transferred by direct contact either by persons actually having the disease or else by carriers. Therefore, children should be instructed as to the dangers of sputum. As the first indication of most of the contagious diseases is a cold with nasal discharge, it would be of importance to exclude children having these colds from school. Children exposed to disease at school should be kept from school, not during the whole period of incubation of the disease, but only during the period when the disease is likely to develop, as shown in the table:—

Disease	Incubation Period	Period during which exposed children should be kept out of school
Scarlet fever	Most often 3 to 4 days	1st to 6th day
Measles	usually 11 days	8th to 18th day
German measles	usually 17 days	10th to 22d day
Chicken-pox	14 to 16 days	10th to 22d day
Whooping-cough	7 to 14 days	1st to 14th day
Mumps	Usually 17 to 20 days	12th to 22d day
Diphtheria	2 to 5 days	1st to 5th day

H. R. M.

DENNETT, ROGER HERBERT: THE CLASSIFICATION AND DIAGNOSIS OF DIARRHEAS IN BOTTLE-FED INFANTS. (Post-Graduate Medical Journal, November, 1914.)

In a careful study of the diarrheas that occur in bottle-fed infants the author attempts to use the teachings of the two different schools that have caused much discussion of this subject, namely, the diarrheas that are due to bacterial infection and the others that are caused by direct action of the food itself upon the digestive apparatus, and upon metabolism. Dr. Dennett is inclined more especially to follow the Finkelstein School and discusses very ably the various causes of diarrheas. He divides his classes as follows: Intestinal indigestion, infectious diarrheas, and miscellaneous. He considers that intestinal indigestion is a factor in the largest class of cases.

Simple intestinal indigestion is, he believes, caused by feeding mixtures containing more fat, sugar, starch or proteid than the individual infant is, at that time, capable of digesting. His experience has led him to believe that a combination of fat, sugar and proteid indigestion, while perhaps originally due to one of these elements, may later be traced to all of them. He also believes that gruels are undoubtedly a contributing factor in the diarrheas of very young infants when given in milk and sugar mixtures, and for this reason and to also simplify the treatment of diarrhea he eliminates this possibility by not using gruels as diluents. Indigestion, whether caused from sugar or fat, lowers the infant's tolerance for any food, so that Dr. Dennett prepares his feedings with weak solutions of milk without sugar, and thus gives the intestinal tract a chance to recuperate from the fat or sugar indigestion, and by so doing raises the tolerance so that milk can gradually be made stronger, increased in quantity, and, later, sugar added. He also calls attention to the fact that underfeeding or over-feeding may be causes of this condition.

The paper is a splendid review of our knowledge of this subject up to the time of its publication, and might be read with interest by all who have infants under their care. R. D. M.

VEEDER, BORDEN S.: ACTIVE IMMUNIZATION AGAINST DIPHTHERIA BY MEANS OF VON BEHRING'S VACCINE AND THE DIPHTHERIA TOXIN SKIN REACTION. (Journal of the American Medical Association, August, 1914, p. 154.)

The weak point in the immunizing use of diphtheria antitoxin lies in the short duration of the passive immunity thus conferred. The injected antitoxin is rapidly broken down and eliminated until, in the average case, there is not sufficient antitoxin left at the end of ten days to afford protection. This work was first brought to our attention by von Behring and Park. This short period of immunization is usually enough to protect the average individual who may be in contact with a case of diphtheria, but as Dr. Veeder says, it is not adapted to protect those who are constantly or repeatedly exposed to infection. It has been found (Park) that if a guinea pig receives ten units of horse diphtheria antitoxin there was only one-half a unit left in the body at the end of seven days. If, on the other hand, a guinea pig is given ten units of guinea-pig antitoxin there was one unit left at the end of fourteen days. In every non-fatal case of diphtheria there is an active production of antitoxin as the result of the reaction of the body to the absorbed diphtheria toxin. This persists for a varied length of time. It has also been found that physicians and nurses working in diphtheria wards produce their own antitoxin. Those who have been working about the wards for a long time show high amounts of antitoxin in their blood, while those who recently have been assigned to duty show low amounts and not infrequently contract the disease. Insensible, active immunization gradually takes place in those who work in diphtheria wards for some length of time. This is an exceedingly common occurrence in a large percentage of individuals, although they may never have had clinical diphtheria. Theobald Smith, in 1909, reported that he had obtained active immunization of guinea pigs which lasted over seven years by the injection of toxin-antitoxin mixtures. He suggested the use of toxin in a slight excess as producing the best result. The first attempt to produce active immunization in man by this method was reported in 1913 by Hahn, who had used vaccine prepared by von Behring. He found that a mixture in which one unit of toxin was neutralized by one unit of antitoxin for the guinea pig was not necessarily a toxic for other species of animal. Thus, if one unit of toxin is combined with twenty to forty units of antitoxin and the mixture injected into a monkey, the toxin causes death, and it is necessary to use 80 to 100 guinea pigs' antitoxin units to neutralize one unit of toxin for the monkey.

The von Behring vaccine consists of a mixture of strong diphtheria toxin and antitoxin in such proportions that the toxin is just neutralized or is in very slight excess. At first the vaccine was injected subcutaneously, and it was found that it required from twenty to twenty-five days before the development of immunity, but if the injections were given intramuscularly a stronger immunity resulted and the interval between the injections and the development of immunity was reduced to ten days. Vaccine of this kind is still in an experimental stage and its final use remains to be determined. So far no bad or unpleasant results have been reported.

The Diphtheria Toxin Skin Reaction—In 1909 Schick found that if a solution of diphtheria toxin was applied to the skin in the same manner that tuberculin is used in the von Pirquet test it produces a reaction in many persons similar to the tuberculin reaction. The toxin used by Schick is a dilution of such strength that 0.1 c.c. equals 1/50 of the lethal dose for a 250-gram guinea pig. The lethal dose of the toxin which Schick uses is 0.005. In those who react an area of reddening and infiltration develops within twenty-four hours, reaching its maximum in forty-eight hours, and heals by scaling, with a central pigmentation. Although the reaction is very similar to the tuberculin reaction it must be interpreted in the opposite direction. A negative reaction is always associated with the presence of diphtheria antitoxin in the blood of the person tested, while a positive reaction, as a rule, is an indication of the absence of antibodies in the person tested.

The practical value of this test is in the fact that when it becomes necessary for prophylactic purposes to immunize large numbers of people against diphtheria only those who give a positive reaction require antitoxin. R. D. M.

McCord, Carey Pratt: The Pineal Gland in Relation to Somatic, Sexual and Mental Development. (Journal of the American Medical Association, July 18, 1914, p. 232.)

Tumors involving the pineal gland cause two distinct systems of symptoms—the neurologic and the metabolic. The neurologic manifestations arise from an encroachment of a tumor on the intercranial contents and are indications of a change in pressure. Such changes are the consequence of pineal tumors at any age of the patient, but if, as Dr. McCord shows later in his paper, the pressure occurs in prepuberal life a second group of changes arise—the metabolic. These alterations are referable to a disturbance in the gland's secretory function. It consists of an early sexual development evidenced in the changes in sex organs, general body hair, early changes in the voice, advanced mental development, which is evidenced by maturity of thought and speech and general body overgrowth, but not exceeding the normal adult. After reading about a case recorded by Machell, Dr. McCord began experimental work with fresh pineal glands from cattle, which he fed to very young animals in minute quantities and recorded the weight changes, sexual difference, and in the case of dogs, increased mentality over control animals maintained under identical conditions. This experimental work involved the use of 110 guinea pigs, 18 puppies, 14 adult dogs and 16 chicks. For the feeding experiments the glands were prepared for permanent use in the following way: The fresh glands were rinsed free of blood and stripped of their adherent tissue, then ground into a fine paste in a Latapie grinder and without drying the paste was mixed with milk sugar in such quantities that ½ grain milk sugar represented 10 mg. pineal tissue. The mass was then made into ½ grain tablets and quickly dried at room temperature. Dr. McCord found early in his work that the more striking results were obtained when the gland tissue from cattle that had not reached adult life was used. His results are intensely interesting, showing a marked disproportion in size and a marked skeletal overgrowth in the chick. This was apparent within three weeks, the larger chick being very awkward in its movements, and, as he says, became a laboratory curiosity. His work on guinea pigs was also most interesting. After ten weeks the guinea pig that had been fed pineal glands was much larger and more mature in appearance.

In none of his cases was there any tendency to giantism, but, on the other hand, the pineal gland seems to more quickly bring the animal up to its adult size. The result of his work leads him to believe that the administration of small quantities of pineal tissue to young animals stimulates rapid growth of the body, but not beyond normal size. R. D. M.

SIMMONS, CHANNING C.: THE TREATMENT OF OSTEOMYELITIS.

Simmons has had an unusual opportunity to observe osteomyelitis in its many forms and at all ages. His cases number 97 and include 83 of the idiopathic, infectious type. Fifty-seven were under fifteen years of age. Trauma is considered a prominent cause in the etiology, somewhat against the more modern belief in a process of embolic origin. Three died. Early operation with free opening of the medulla is the only treatment and exploratory operation is justifiable in the doubtful cases. Simmons has never failed to find pus or positive culture in any explored case. A trephine or burr is used to open the bone and enough openings are made to give drainage and to expose normal marrow. In the more chronic cases with destruction of bone subperiosteal resection is recommended, but regeneration does not always take place. Later a transplant is required. For chronic abscess bone wax is used as a filling, but it is always extruded. The paper is profusely illustrated with X-rays and photographs. C. E. F.

LUCAS, WILLIAM P.: DIAGNOSIS, SIGNIFICANCE AND TREATMENT OF BRONCHIAL GLANDS IN INFANCY AND CHILDHOOD. (California State Journal of Medicine, August, 1914.)

Lucas distinguishes three stages of tuberculosis. First, a primary infection of the regionary lymph glands. Second, a spread of infection to neighboring structures by direct connection. Third, a tertiary form occurring often years after the primary infection, which is generally spoken of as tuberculosis and which has the tendency of producing cavities. The anatomy of the chest contents in children differs so much from the findings in adults that the physical signs are often so confusing as to make it necessary to study the history of exposure in order to arrive at a diagnosis. In the chronic glandular type this is not easy. The early symptoms are increased nervous irritability, changes in disposition, fits of temper and crying for no obvious cause, and sometimes slight attacks of indigestion. There is a uniform lack or loss of tissue turgor. Pallor and cold hands and feet associated with vasomotor changes are common. The temperature curve is irregular—usually elevated in the morning and down in the afternoon.

These cases often give a history of a previous infection, such as tonsillitis, pharyngitis, repeated colds, measles and pertussis. These infections have lowered resistance and have caused a local infection of the bronchial glands which is followed by tuberculosis. The physical examination of these cases is unsatisfactory. Auscultation usually will demonstrate the presence of infected pulmonary glands by a diminution in the vesicular murmur, harsh, high-pitched breathing, which at times may be bronchial in character, and increased bronchophony, which is heard in extreme cases as low as the tenth interspace.

X-ray findings are of value in diagnosis if properly interpreted with regard to the other symptoms and to the topographical positions of the glands. Where infiltration of the bronchi exists, or where the glands outside the median shadow are enlarged, a characteristic picture is seen. By the use of the X-ray three types of involvement can be discerned. First, those in which some or all of the glandular groups are enlarged. Second, those in which, besides the glandular enlargement, there is a peribronchial infiltration. Third, those in which the infected parenchyma gives a mottled, indistinct, diffuse appearance. The tuberculin reaction is of value in diagnosis only in conjunction with the other findings. The prognosis is better in children over three years of age. A gain in weight and a non-variable temperature is also of prognostic value.

Treatment consists of an out-of-door life, restriction of activity, long periods of rest and sleep, and a diet high in calories, containing high proteid and carbohydrate and a moderate fat content. Tuberculin treatment is a mooted question, although in these glandular cases there is more chance of success in its use.

R. M.

NEUHOF, H.: TRAUMATIC INTRA-ACETABULAR SEPARATION OF THE PELVIC BONES. (Annals of Surgery, 1914, Vol. LX., p. 367.)

Neuhof's case is apparently unique in medical history. A girl of six fell, while playing, with the left leg extended, striking the hip on the floor. Pain was severe at first, but lessened by rest in bed. At the end of a week she could walk, but limped and kept the left hip adducted. Motions were painful and limited. There was no local tenderness or ecchymosis. The trochanter was pushed upward and forward a little and the rectal examination revealed a tender spot corresponding to the acetabulum. The X-ray showed a separation of the ilium from the ischium and the pubis in the acetabulum. Recovery was complete following the use of a plaster spica.

C. E. F.

LOVETT, R. W.: USE OF SILK LIGAMENTS AT THE ANKLE IN INFANTILE PARALYSIS. (American Journal of Orthopedic Surgery, January, 1915.)

Lovett analyzes the results of 79 operations performed by 6 surgeons with the insertion of silk artificial ligaments in the ankle joint in cases of infantile paralysis. The results are overwhelmingly better where the bone was drilled for the insertion of the new ligament—70 per cent., as compared with only 30 per cent. in the cases in which the insertion was periosteal only. Lovett believes that the operation is of very great benefit in properly selected cases, that the technic must be most rigid, that the particular form of silk used is of no especial importance, and, finally, most important of all is the prolonged fixation of the joint, as the silk is not strong enough of itself to hold the ankle in position, but simply serves as the anlage of a new fibrous tissue tendon.

C. E. F.

SCUDDER, C. L.: SIGNIFICANCE OF ROENTGEN-RAY EXAMINATION FOLLOWING OPERATION FOR CONGENITAL PYLORIC TUMOR. (Boston Medical and Surgical Journal, February, 1915.)

Scudder is firmly of the opinion that the tumor found at operation for pyloric obstruction in infants is a permanent affair and that the element of spasm does not enter into the case. He bases his belief on the report of 3 cases seen from three to nine months after operation and on the X-ray examination of 26 operated cases. The tumor has no tendency to disappear. The lesson to be learned from this is that it is a great mistake in these cases to wait for any hypothetic spasm to subside, thus losing invaluable time and rendering the inevitable operation an extremely dangerous one.

C. E. F.

SIMMONS, H. J. F.: TORTICOLLIS. (Journal of American Medical Association, February 20, 1915, p. 645.)

Simmons reports on 100 consecutive cases as seen at the Children's Hospital in Boston. The etiology of the congenital cases is unknown, but appears to be possibly a myostitis rather than a hemorrhage in the muscle as commonly supposed. The lower half of the muscle is supplied by the sternomastoid branch of the superior thyroid artery and in certain positions of the fetal head it is probable that the blood supply is cut off. The result is a waxy degeneration of the muscle and subsequent contraction. The acquired type of torticollis has many causes, but they are usually easy to find from a careful history. Briefly, the causes are inflammatory or traumatic or possibly paralytic. The diagnosis is easy, even in the slight cases. Treatment consists of manipulation, usually under an anesthetic, with forcible correction, or operation. Forcible correction is not by any means free from danger and open operation is advocated in all but the very slightest deformities, in which massage and apparatus may reduce the condition. Subcutaneous tenotomy is to be condemned.

Operation consists of free division of the sternomastoid at the upper or lower end, with excision of any restraining bands of fascia. The muscle itself may be excised if necessary. Apparatus should be worn for a year, plaster helmet at first, followed by a steel chin support. The results are uniformly satisfactory; 39 of 45 cases examined carefully after a long period of time were cured. Failures were due to improper diagnosis or to failure to remove sufficient tissue or to lack of proper after care. C. E. F.

CRAIGE, BRANCH: THE NURSING INFANT. (Journal of the American Medical Association, February 6, 1915, p. 502.)

This interesting paper offers nothing new in managing the nursing infant, but does offer some practical suggestions for the general practitioner in the prevention and correction of nutritional disturbances due to faulty feeding. Three-hour intervals from birth are advocated by the author and general hygiene for the mother is insisted upon. The different food elements are taken up and the results of an excess of each are brought clearly to mind. For the treatment of protein colic he has had good results with peptonizing powder dissolved in warm water and given before each nursing. He points out the fact that unsatisfactory weight may be the result of overfeeding as well as underfeeding. Weight fluctuations are as common in children as in adults, therefore the food should not be changed immediately. A mother suffering from tuberculosis, or pregnancy intervening, or complications following labor, or nephritis, grave anemias or heart disease should not nurse her baby. Early weaning without just cause should be condemned, remembering that 85 per cent. of all babies who die before two years of age are bottle-fed. At the same time weaning at seven to nine months is advisable, owing to the danger of malnutrition or rickets. H. R. M.

WESTMEYER, JOSEF: CHRONIC RHEUMATISM IN CHILDHOOD. (Jahrb. für Kinderhk., January, 1915, p. 69.)

Westmeyer calls attention to the rarity of chronic rheumatism in children; 273 cases have been reported, 30 of which are from America. The author himself has observed 3 cases which he describes in detail, together with 2 more cases which his chief, Goppert, has observed. In none of these cases was there any evidence of tuberculosis as an etiological factor. Most of the patients lived in damp, poorly-kept houses. The disease begins with fever, followed by a swelling of the joints. In the 5 cases studied by the author the spinal column was affected in all but 1 case. The swellings of the joints become so large at times that they resemble new growths.

According to Westmeyer, chronic rheumatism cannot be differentiated from so-called "Still's disease," which latter name should not be used at all. The prognosis in this condition should always be guarded. Some cases are improved under treatment, and some are cured, while others are not benefited at all. Treatment with salicylates seems to have no effect on this condition. Hot baths, hot air, and hot applications seem to do the most good in combination with massage and active and passive exercises.

J. S. L.

EPSTEIN, S.: THE TREATMENT OF CERVICAL LYMPH ADENITIS IN CHILDREN. (The American Journal of Obstetrics and Diseases of Women and Children, February, 1915, p. 356.)

To properly treat cervical lymphadenitis the source of the trouble must be located and properly treated. Every enlarged group of lymph glands is a guide to some focal infection. This done, the author uses a weak dilution of liq. aluminii acetat, 8 per cent., a tablespoon to a half glass of cold water, and applies it as a local dressing. This may be changed every two or three hours during the acute stage. It is important to keep the bandage covered with oiled silk and absorbent cotton or flannel. In cases of tuberculous cervical lymphadenitis the general regime for tuberculosis should be followed. Tonsillectomy may be indicated. This treatment does more good than any ointment and it is cleaner and has no objectionable odor.

H. R. M.

LEWISOHN, RICHARD: A NEW AND GREATLY SIMPLIFIED METHOD OF BLOOD TRANSFUSION. (Medical Record, January 23, 1915, p. 141.)

This method was tested on dogs and afterward used on 2 patients (transfusions of 300 c.c. and 500 c.c. respectively) without any untoward symptoms. The previous difficulty in blood transfusions has been a too rapid coagulation of the blood outside of the body. If this could be obviated transfusion could be performed with the greatest ease and without acquiring any special technique, and should be as simple as an ordinary saline infusion. Leech extract (hirudin) and sodium citrate were therefore tried out, but the former was soon discarded, owing to its toxic effect if given in sufficient quantity to prevent coagulation. It was found that 0.2 per cent. of sodium citrate added to the blood prevented coagulation for twenty to thirty minutes. The next point to be taken up was the question as to whether the coagulation time of the blood of the recipient was retarded. If so, its general use in blood transfusions would be greatly impaired (purpura, hemophilia, etc.). It was found that the coagulation time, instead of being retarded, *was actually hastened,* at least immediately after the transfusion. The simplest outfit imaginable was used. The blood is allowed to run through an ordinary glass cannula into a glass jar, containing 5 c.c. of 10 per cent. sodium citrate solution. While the blood was running into the jar it was stirred with a glass rod to effect a good mixture of blood and sodium citrate solution. The blood was then poured into an ordinary glass funnel, which was connected with the other cannula by a piece of rubber tubing. The whole procedure took about five minutes.

H. R. M.

DUNN, ARTHUR D.: ON THE USE OF ALKALIES AND SALTS IN CERTAIN CLINICAL CONDITIONS OF APPARENTLY OBSCURE ORIGIN. (St. Paul Medical Journal, February, 1915, p. 116.)

Colloids and crystalloids are described from their chemical standpoint as to their specific properties and reactions in the presence of watery solutions. Wells defines the cell from the standpoint of physical chemistry as a "collection of colloids and crystalloids, electrolytes and non-electrolytes, dissolved in water, in lipoids, and in each other surrounded by a semi-permeable membrane and perhaps subdivided by similar membranes and surfaces." Five distinct properties of colloids are enumerated and great emphasis put upon the rôle that the colloid element of body cells plays in toxic processes, viz, every organ of the body has a normal state of swelling and a normal water content. The stability of the water content of the cells depends on the presence of certain electrolytes and non-electrolytes and on the maintenance of a neutral reaction. The rôle of water in metabolism has been neglected. The presence of a definite amount of water in different parts of the body is necessary to life. Water mobilization is a function of the swelling and inswelling of colloids. All toxic processes result sooner or later in a lack of oxygen. Every deficiency of oxygen results in an abnormal acid production in the cell (Araki). In toxic conditions cloudy swelling of different organs is invariably found postmortem.

The writer presents 5 cases of toxic origin, in all of which general acidosis was diagnosed and in which the ammonia content of the urine was significantly high. The result of alkalin treatment in all these cases was prompt and efficient.

The reviewer believes that the cases described in this article bear a great resemblance to the conditions obtaining in the acute intoxications of infants, and, consequently, alkalin therapy based on the colloid theory might be worthy of trial. E. F. W.

ELIAS, LEWIS W.: SYPHILIS IN CHILDREN WITH SPECIAL REFERENCE TO MODERN THERAPY. (Charlotte Medical Journal, December, 1914, p. 378.)

In a complete review of the modern treatment of syphilis in children Elias presents the result of his work in infancy. He says that, generally speaking, the early stages of syphilis in children corresponds to the secondary form in the adult, while the late form in older children is similar to the tertiary manifestations in the adult. Evidence of syphilis almost invariably appears in the first three months of life. Of 1,000 cases the symptoms appeared in the second, third and fourth week in over 55 per cent. of the cases. Usually snuffles and the hoarse cry caused by the catarrh of the nose and throat are the first symptoms noted. This is usually followed by eruption upon the face and extremities, but rather scant upon chest and abdomen. Mucous patches are seen upon the muco-cutaneous surfaces and where the skin is thin. The early bone lesions are an epiphysitis of the long bones, resulting in tenderness and often a pseudoparalysis of the upper extremities. The spleen is almost always large in all stages of syphilis. Elias depends more upon the Wassermann reaction than upon the symptoms in any individual case and quotes the work of Holt and Alan Brown at the Babies' Hospital for their early work on this subject. He also describes the luetin test of Noguchi, but believes that the results of it are disappointing. Elias describes 1 case very thoroughly and urges the use of salvarsan and also neosalvarsan in all cases. R. D. M.

BRADY, JULES M.: HEMORRHAGIC DISEASE OF THE NEWBORN. (Missouri State Medical Association, January, 1915, p. 21.)

To Townsend, of Boston, belongs the credit of first describing "Hemorrhagic Disease of the Newborn" as a disease *sui generis*. The process of blood clotting is very intricate and not entirely understood. Five factors are essential in the coagulation of blood: (1) Calcium salts, (2) kinase, (3) prothrombin, (4) fibrinogen, (5) fibrin ferment. These factors must be properly proportioned to bring about normal coagulation.

Pathology—(1) Those due to syphilis, (2) those due to bacterial infection, (3) those the etiology of which is unknown. These latter are classed under the caption, "Hemorrhagic Diseases of the Newborn."

Therapy—The calcium treatment has been an absolute failure. The injection of human blood or serum intramuscularly as first introduced by Welch of New York in 1910 shows practically no mortality, providing the baby is not moribund. The dose is 15-30 c.c. of whole blood every four to eight hours, depending on the urgency of the case. The difficult operation of transfusion should be reserved for moribund cases.

E. F. W.

GEMMILL, WILLIAM: A TREATMENT FOR PROLAPSUS ANI IN YOUNG CHILDREN. (The Lancet, December 19, 1914, p. 1,411.)

The writer states that this method has to do with the prolapse *per se* and not with any exciting causes. This method was first tried more than two years ago in an apparently hopeless case, which had resisted all ordinary methods of retention. The position and forces concerned in normal defecation are considered and shown to be a powerful aggravation in the condition of prolapse, hence the need of their temporary inhibition. This is accomplished by preventing flexion of the spine and thighs by means of a splint reaching from neck to heels and incorporating an iron-ring hiatus just large enough to snugly fit the buttocks and permit of defecation without removal of the splint. The relief given is immediate, prolapse not recurring even during defecation, for which the splint must not be removed. The advantages are efficiency, simplicity and ease of management, the child very soon becoming comfortable and happy. The splint may be retained as long as is necessary for the restoration of normal conditions.

W. L.

Helmick, A. G.: Serum Therapy of Epidemic Cerebrospinal Meningitis in Childhood. (Ohio State Medical Journal, January 15, 1915, p. 17.)

The following guides and indications for the administration of the Flexner serum are: (1) The drainage of the spinal canal is safe when properly done. (2) The serum should be used whenever the spinal fluid is not absolutely clear. (3) Children over two years should receive 30 c.c. of serum, babies 15 c.c. Dosage is dependent to a great extent on the amount of fluid withdrawn and the amount of pressure and resistance encountered. (4) The dosage should be repeated once in twenty-four hours. Every case should receive at least four injections, and if diplococci persist daily dosage should be given until they disappear.

E. F. W.

Achard, H. J.: Some Remarks on the Antituberculosis Campaign. (The Lancet Clinic, January 30, 1915, p. 123.)

The antituberculosis campaign, in recent years, has been productive of great good to mankind. It is very efficient as far as it goes, but it will never eradicate the disease. It holds the disease in check and restores a certain percentage of lives to useful pursuits. The author believes that immunity to tuberculosis can be conferred by vaccination. Arguing from the known fact that small-pox and typhoid are preventable diseases, the author claims that the only way to bring about the eradication of tuberculosis is through vaccination of children, inasmuch as statistics show that 80 per cent. of all adults have been infected during childhood and only about 20 per cent. acquire clinical tuberculosis. Immunity to disease is acquired through infection, hereditary transmission and vaccination.

Within the last three years a more complete vaccine, quantitatively, was perfected, which contains all proteid and fatty constituents of tubercle bacilli in solution, in optimal proportions, and the *raison d'être* of this complete vaccine has incidentally been vindicated by the well-known researches of Deycke and Much on partial antigens. A single dose of a vaccine in solution will produce an active immunity against the tubercle bacillus in the normal, not yet tuberculized organism. The expectation is, therefore, justified that by the means just indicated it will be possible to secure to the coming generation a relative freedom from tuberculous disease.

E. F. W.

ARCHIVES OF PEDIATRICS

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EDITORIAL

THE PRESENT NUMBER AND THE NEXT

The ARCHIVES presents without apology and with considerable satisfaction the complete report of the Twenty-seventh Annual Meeting of the American Pediatric Society, held recently at Lakewood, N. J. We are sure that the many instructive papers there presented and discussed will prove of great value and interest to our readers.

The June number of the ARCHIVES will initiate a series of *city* numbers, wherein the papers will be written by men from some one of the larger cities of this country, together with a review of the pediatric activities of that city. Boston, the easternmost of the pediatric centers, will contribute the first, "The Boston Number of the ARCHIVES."

ORIGINAL COMMUNICATIONS

HYPERTROPHY OF THE THYMUS AND THYMUS DEATH, WITH A REPORT OF CASES *

BY THEODORE LE BOUTILLIER, M.D.

Professor of Pediatrics in the Women's Medical College of Pennsylvania, and Visiting Physician to the Philadelphia Hospital for Contagious Diseases.

For over half a century the thymus gland has been played like a shuttlecock from one discussion to another; regarding its size and weight; anatomical relation; the possibility of causing death and how such death takes place; the possibility of tracheal stenosis due to pressure; and, more recently, the question of its internal secretion. All these points have their supporters and disclaimers and to-day we find some cleared up, while others still need more research before definite conclusions can be reached.

The oft-quoted Friedleben gave the first weight of the thymus at different ages, but these do not agree with those of more recent investigators, as they were much greater; for instance, at birth, he gives the weight as 14.3 grams, while Bovaird and Nicoll give 7.7 grams as the birth weight and others as low as 4 grams. Thus we see the diversity of opinion on this point alone. It seems best to take the medium ground of Holt, taking 7.4 grams as the normal average weight of the thymus at birth. The nutritional condition of the infant is of importance, as we find that normal, healthy infants dying shortly after birth have a much larger thymus than those infants who show marked signs of malnutrition, for in these cases we have a decided atrophy of the thymus as well as the other bodily structures. The gland appears to increase in size for the first three or four years of life, from which time there is a gradual decrease until puberty is reached, when, in most cases, it disappears, or, in a much atrophied state, remains throughout life. In considering the abnormal weight of the thymus, we find a diversity of opinion in this regard also. Some investigators state that a gland weighing over 10 grams is abnormal, while others allow a greater latitude, varying from 15 to 20 grams.

*** Read before the Pediatric Society of Philadelphia, April 13, 1915.**

With regard to the anatomical position of the gland, Lerch[1] states that the phrenic nerves and the pericardial phrenic artery border the thymus on both sides, while it rests with its lower pole upon the pericardium, reaching usually to the fifth costal cartilage, the posterior surface lying upon the right auricle and ascending aorta, reaching occasionally to the bifurcation of the trachea. It is in contact on the right with the superior vena cava and right innominate vein, resting above the left innominate vein and directly upon the trachea. The pneumogastric and recurrent laryngeal nerves border it on the left.

The gland has a rich arterial blood supply, while there is only a single network of veins emerging from it. This decided disproportion means that it will share in every disturbance of the general circulation. Owing to its position, one can readily see how enlargement of the thymus will cause pressure upon some of the most important organs and structures of the body and when this pressure is exerted in a space approximately 2 cm. between the unyielding sternum and the spinal column, the amount of pressure exerted is, at times, very great.

The form of the gland itself is of importance in this connection. It may be a large, spread-out gland which has comparatively little thickness and which is decidedly yielding, while again we find a gland that is much more firm and does not spread out to any great extent but where the thickness is so great as to fill the entire space between the sternum and vertebræ. Between these two extremes many other types of enlargement will be found. While it is believed that the internal secretion of this gland plays a most important part in functional and general disturbances—a part that is so great that in many conditions it is supposed to be the cause of numerous sudden deaths—we are at present unable to prove this conclusively.

The various conditions caused by an enlarged thymus are well covered by Pfaundler,[2] who states that they are as follows:—

(1) Tracheal stenosis.

(2) Pressure by the gland upon the circulatory system and nerves.

(3) Status lymphaticus.

(4) Laryngospasm.

(5) Dyscrasias caused by functional troubles of the gland itself.

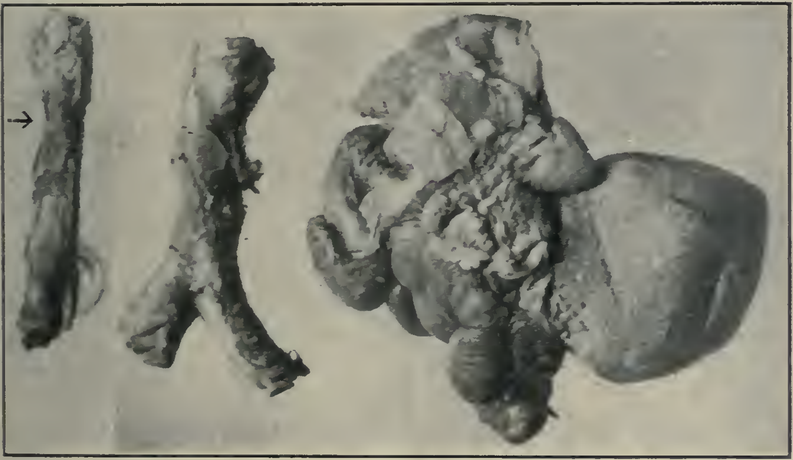
These five heads practically cover the conditions which have been found by numerous investigators at autopsy. The cases which I have to report are to be found under some of these heads.

Case I. The notes on this case were kindly given me by Dr. Alice Weld Tallant. M. H., born November 25, 1914. Family history negative, mother being in good condition. The child when born was in the condition of asphyxia pallida, owing to the fact that the cord was twice around its neck. In every other respect he was perfectly normal, weighing 6 pounds, 5 ounces. He continued to do well, gaining in weight from the seventh day and appeared to be a healthy baby. On the thirteenth day the child was found dead in its crib, not having had any symptoms which would lead one to suspect its condition.

A report of the autopsy made by Dr. Berta Meine is as follows: On opening the body, the organs of the abdominal cavity all showed marked passive congestion. The mesentery and retroperitoneal glands were remarkably prominent, some being as large as a split pea. The spleen showed follicular hyperplasia. The thorax contained a small amount of very slightly blood-tinged fluid. The lungs were deep red in color, while the large vessels stood out prominently. The thymus was very large and covered the entire anterior surface of the heart, the right lobe being twice the length and thickness of the left lobe. Its weight was found to be 65 grams. Two of the bronchial glands were also large and the heart was found to contain red and white clots, while the valves, foramen ovale and ductus arteriosis were normal. The brain showed marked congestion, while there were a few hemorrhagic areas at its base. The diagnosis in this case was status thymolymphaticus, while the direct cause of death was probably pressure on the base of the heart and its ganglions by the enormously enlarged thymus.

All writers agree as to the general condition of infants dying thus: they are well nourished, even fat, and in many cases the only condition present is a moderate degree of anemia. Here the cause of death is shown to have been direct pressure on the heart and its ganglions. There was no tracheostenosis and no pressure exerted on the aorta or great vessels. It is the type seen most frequently in newborn infants and those dying shortly after birth.

CASE II. R. S., born June 29, 1914, after a normal labor, infant not cyanotic, respiration normal. The family history was negative, the parents being normal in every respect. He was breast-fed and perfectly healthy, having had no attacks of bronchitis, dyspnea or cyanosis. Case was seen by me ten days before death took place, at which time he was in perfect health. On December 24, 1914, at 9 A.M., he was put on the porch in a new sleeping bag for his morning nap, the only difference being that a small hair pillow had been used. He was placed on his side and went to sleep promptly. At noon, when the mother went to waken him for his feeding, she found him dead. He had rolled over on his abdomen and the face was markedly cyanotic. From the position of the hands, by his side, and from the fact that the covers were not disturbed, it seems to prove conclusively that death was sudden. The mother at once tried artificial respiration and called in a local physician, who came immediately. Three hours later, I found the cyanotic condition had almost disappeared, while rigidity was taking place. The expression of the face was peaceful and had been at the time the mother found him. The next day an autopsy was performed by Dr. Damon B. Pfeiffer and the following notes made:



CASE II.—Baby six months old. Thymus gland and trachea, life size; trachea on left showing stenotic portion

The body was that of a male child aged six months, well nourished, well formed, presenting no external abnormality. On opening the chest the lungs were seen to be voluminous and contained air throughout; they presented no other abnormality, either externally or on section. The pleura was smooth, contained no fluid and there were no evidences of inflammation. The heart and pericardium were normal. The foramen ovale showed a slight opening which was, however, completely closed by a fibrous, valve-like membrane. The thymus was obviously much enlarged and was found later to measure 7 cm. in width by 5 cm. in length and 2.5 cm. in thickness, and weighed 29 grams. On lifting the thymus from the trachea, there was found immediately beneath the isthmus, 1.5 cm. above the bifurcation of the trachea, a depression situated rather more on the left side of the trachea than on the right, but affecting practically the whole trachea. This depression was about 1.5 cm. in length. The cartilaginous rings of the trachea at this point were much softer than either above or below the depression and the anterior wall could be easily approximated to the posterior wall with the effect of closing the lumen at this point. This could not readily be done below or above, because of the elasticity and resilience of the cartilaginous support.

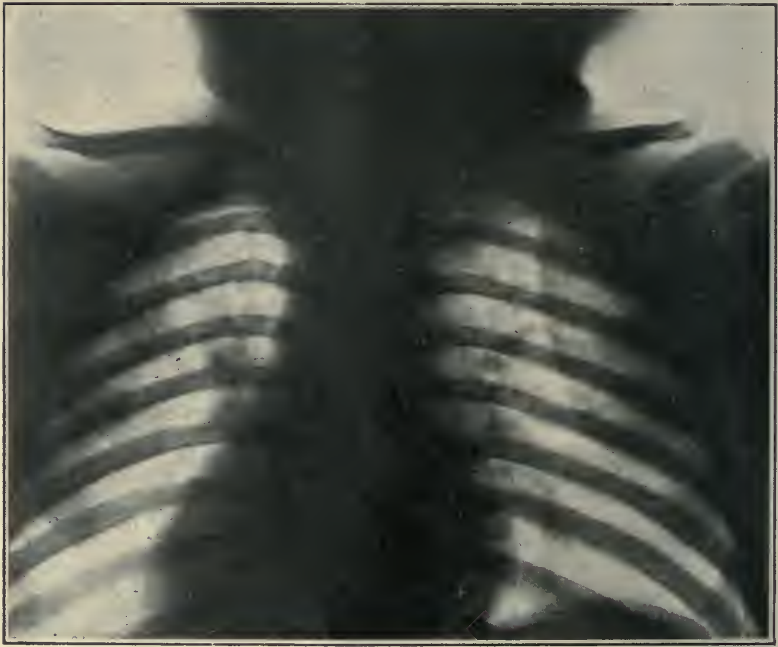
On removing the trachea, and looking down through its lumen from above, one could see that corresponding to the external depression the lumen was encroached upon, though not under these conditions completely closed. The abdomen and other viscera showed nothing unusual. The enlargement of the thymus, the depression noted beneath the isthmus, the increased compressibility at this point and the voluminous lungs justified the belief that thymic tracheostenosis was the cause of death. This was further strengthened by microscopic examination of the thymus, which showed marked congestion. In addition to the venous congestion, there was observed a marked serous infiltration, apparently interstitial and not confined to vascular limits. It was not possible to determine definitely whether or not this was an antemortem or a postmortem change, the autopsy being conducted in a private house and an interval of approximately twenty-eight hours had elapsed before the tissue was fixed. Of a marked and abnormal degree of congestion, however, there was no doubt.

This case brings out forcibly the point which many writers dispute, that is, the possibility of the thymus causing such marked pressure on the trachea as to cause a severe degree of a tracheostenosis. The autopsy proves clearly that here the pressure on the tracheal rings was not only severe but of comparatively long standing, for with the removal of the thymus, the rings did not regain their normal shape, but, as you will see from the specimen, still retain their somewhat flattened-out appearance. This is proof positive that death was due to the sudden cutting off of the air supply, most likely produced when the baby turned from his side on to his abdomen, thereby causing slight backward extension of the head, thus narrowing the distance between the vertebræ and the sternum, causing absolute compression of the already stenotic trachea.

Some anatomists claim that the trachea in normal infants is ovoid in shape, but here we find the rings above and below the compressed area to have been perfectly circular when examined after death. A further important point which is brought out strongly by some authors and which is shown clearly by this specimen is that it is of the plump variety instead of belonging to the flattened-out class.

CASE III. F. C., aged two and one-half years, admitted to the Philadelphia Hospital for Contagious Diseases February 26, 1915, said to be suffering from laryngeal diphtheria. This case gives a negative history. Parents both living and brother and sister normal. Adenoids and tonsils removed about two weeks before admission to the hospital. He was taken to another hospital January 26th suffering from a similar attack, but was not admitted owing to that fact that the diagnosis of diphtheria was made. Child had an attack of croupy cough, dyspnea and cyanosis, voice remaining clear. Was intubated with some relief and sent to the hospital. The tube was removed on admission and was not used again. The attacks lasted from one to two hours, occurred during day or night, and following the attack the child would go to sleep and wake up in a normal condition. Anger or examination would start up a mild dyspnea and slight cyanosis. He remained in the hospital until March 6th. Cultures were negative during the entire time. He was returned to the hospital on the 19th, having been intubated by a different physician. The tube was coughed up in the ambulance and was not replaced. He was discharged on March 11th at noon and brought in again at

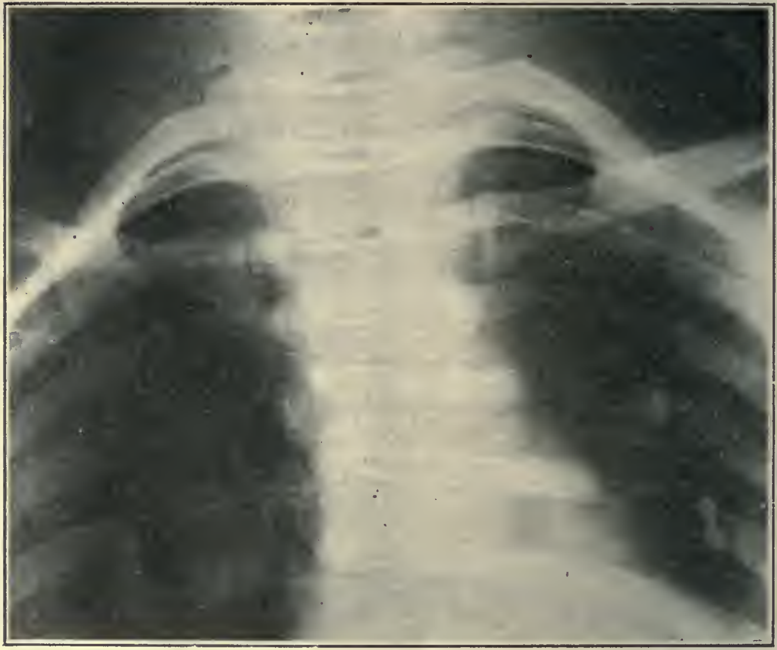
5:30 the same evening, as he had a severe attack of dyspnea. An examination made in the hospital gave the following results: Light percussion showed dullness on both sides of the clavicle, right border from 1 to 1½ cm. from the sternal edge in the first and second interspaces; left from 1½ to 2 cm. in the first and second left interspaces, blending with the cardiac dullness. Following deep inspiration, the dullness appeared to be slightly increased, while at the same time in the episternal notch a vaguely felt mass was palpable. With head extended, respiration was distinctly more difficult. Following his third release from the hospital, the child was sent to the Mary Drexel Home for treatment. Dr. Miller, of the X-Ray Department of the German Hospital, made two plates for me, one of which is here presented. It shows a moderate degree of enlargement of the thymus, though not so marked as in many cases, but still enough to cause the condition present. A lateral plate shows that the thickness of the gland is increased to a considerable extent, but apparently not occupy-



CASE III.—Boy, two and one-half years. Shadow of enlarged thymus shown in first, second and third interspaces ing the entire area between the sternum and vertebræ. The case presents a typical picture of the so-called thymic asthma, where we have paroxysmal attacks of dyspnea during which time there is a constant inspiratory stridor with clear voice sounds, the attacks being frequently produced by crying from either pain or anger. It is also important from the fact that we have a child brought into a hospital for contagious diseases said to be suffering from laryngeal diphtheria where no such disease exists. It brings up forcibly the extreme care and caution which should be used in making our diagnosis in this condition, and the need for a careful examination of the child, and in training ourselves not to overlook the enlargement of the thymus gland as a possible cause for paroxysmal dyspnea with stridor. At the same time, it is important for us to remember other conditions which may bring about these symptoms; the possibility of mediastinal abscesses, enlargement of the tracheal or bronchial glands, retropharyngeal abscess, polyps, laryngitis and laryngospasm, and also a congenital stridor, which is seen in a small number of cases.

The palpation of the enlarged thymus is not always possible, but occasionally it is found on deep inspiration by pressure in the episternal notch. This is especially true if the head is slightly extended at the same time the child takes a deep inspiration. Percussion is of more valuable aid, giving over an enlarged thymus an irregular, triangular area with a base above and extending downward into the second and third interspaces, rather more to the left than to the right and on the left side frequently blending with the cardiac dullness. The X-ray is the most reliable of all our methods for distinguishing enlargement of the thymus gland.

CASE IV. C. H., age fourteen, brought to us on account of swelling of the thyroid gland of over one year's duration. Family history negative, no other members of the family, so far as is known, having had goiter. She has never had any serious illness. Swelling has gradually increased in size until it is now very marked, especially in the right lobe, which is distinctly harder than the left. There has been no history of dyspnea, cyanosis or pallor in this case. Heart action is regular, no palpitation, no murmurs heard, no hum audible over thyroid gland. On percussion over upper portion of chest we found impaired resonance in the first interspace 2 cm. to the right of the right border of the sternum; 2 cm. in the second interspace and at the sternal border in the third. On the left side, the impaired resonance extends 3 cm. to the left in the first interspace, 2½ cm. in the second interspace, blending with the cardiac dullness in the third. The upper border of the thymus was not palpable in the episternal notch. This case also was X-rayed for me by Dr. Miller. The picture shows that the enlarged thymus corresponds fairly well with the outline obtained on percussion.



CASE IV.—Girl, aged fourteen years. Faint outline of enlarged thymus in the first, second and third interspaces; outline of goiter above

While this child shows no pressure symptoms, it is important for us to recognize, as pointed out by Crotti and others, the great frequency with which enlargement of the thymus is associated with goiter either of the simple or exophthalmic variety. This case gives no symptoms of exophthalmus. Many deaths have been reported where operations have been performed for removal, partial or total, of the thyroid gland. In all of these cases where autopsy has been performed an enlarged thymus has been found. For that reason it is necessary that operations on the thyroid gland should be advised with caution, unless we have definite proof that there is no enlargement of the thymus gland. An important point to be brought out in this case is the necessity for a more careful study of each individual infant or child coming under our supervision as to the possibility of a hypertrophied thymus and for the proper steps to be taken in cases where such a condition is found to exist.

The treatment, as far as it has been studied, consists of operations by means of which the gland is partially or entirely removed, or at least is drawn under either clavicle so as to cause less pressure upon the important structures lying beneath it. Reports on this procedure are not very encouraging, as the mortality rate is high. The present treatment by the use of the X-ray appears to give more favorable results according to the published reports. This seems to be the most rational method that can be employed at the present time. X-ray treatments are given from two to five times a week, depending on the gravity of the case and the amount of pressure symptoms which are present. From two to four weeks is the usual length of time for employing the treatment. The results show marked diminution in the size of the gland and a relief of the pressure symptoms. Until we know more about the internal secretion of the thymus gland, however, we shall still be laboring, to a certain extent, in the dark, not knowing its relation to the causation of other diseases.

The conclusions which we have reached in the study of these cases may be briefly outlined as follows: No infant or young child should come under observation without a most thorough and careful examination of the chest in the region of the thymus gland, to determine if there is an enlargement of this gland. This is especially true in children who have slight or marked dyspnea or cyanosis which cannot be traced to any other condition. In any case, where the diagnosis is not absolute, the child should be X-rayed. I feel sure that in many instances there is a more or less sudden engorgement of the thymus gland due to some derangement in the general arterial system which may in some cases be great enough to cause death; that tracheostenosis is a positive condition and that death is caused by it in certain cases; that the importance of enlarged thymus in goiter must not be overlooked.

In conclusion, it is to be emphasized that while our knowledge is daily increasing, we need a much further study as to the action of the internal secretion of the thymus gland before we can state what part this plays in the causation of sudden death.

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Infectious Affections of the Urinary Organs in Infants—H. L. Kowitz (Münch. med. Woch., July, 1914) says that pyelonephritis in the infant is generally diagnosed cystitis, and hence is believed to be of ascending origin. Because of this mistaken diagnosis its occurrence is considered much rarer than it in reality is. The author believes it to be of hematogenous origin, and hence a descending infection, generally caused by the bacillus coli, or by the streptococcus in the blood. Between the middle of August and the end of December, 1913, the author treated seventeen boys and twenty-three girls with this affection. The pyelocystitis is generally preceded by gastrointestinal symptoms for several months. The largest number of cases occurred in July, the smallest in winter, when intestinal troubles are least frequent. Escherich found in pure culture the bacillus coli oftenest; also the paracolon bacillus, and bacillus lactis aerogenes. In children with eczema or furunculosis the author found staphylococci, in three cases there were mixed infections of bacillus coli with saprophytes, with streptococci and staphylococci. At first there was bacteriuria with albuminuria, and later casts and epithelium.—*The American Journal of Obstetrics.*

AMERICAN PEDIATRIC SOCIETY

Twenty-seventh Annual Meeting, Held at Lakewood, N. J.
May 24, 25 and 26, 1915

THE PRESIDENT, DR. GEORGE N. ACKER, OF WASHINGTON,
IN THE CHAIR

ADDRESS OF THE PRESIDENT

DR. GEORGE N. ACKER, Washington, D. C., declared that there was no question of greater moment before the public in general, and the Society in particular, today than that of Child Welfare. The importance of this subject had found national expression in the establishment of the Children's Bureau of the Department of Labor. This Bureau, under the guidance of its director, had done creditable work, not the least interesting and important of which was that done at Johnstown, Pennsylvania. That the wage of the father was the key to the infant's chance to live loomed up as the feature of the first report of the Children's Bureau in its study of infant mortality in the United States. The death rate among children was in inverse proportion to the earning capacity of their fathers. The infant death rate was five times as high in a poor, unsanitary section of the city as in a better residential district. In families where the earnings of the father were less than $10 per week the infant mortality was 256 per 1,000 babies; whereas, in those where the earnings were in excess of $25 the mortality was 84 per 1,000. This report also seemed to show the importance of breast feeding for at least three months—only 46.6 babies per 1,000 dying under one year of age when breast fed for at least three months, as against 165 per 1,000 when fed exclusively on artificial food up to the age of three months. The city was found to bear its share of responsibility in the infant mortality, a high death rate being coincident with neglected streets and unsanitary housing. Takng boarders in the home or work outside of the home on the part of the mother seemed also to have a large influence in increasing the mortality of their infants.

The Children's Bureau was trying to find the conditions of life most favorable to the American baby. Every mother of a Johnstown baby was visited by a woman agent of the Bureau and information obtained concerning the environment of the baby. The subjects considered in this report were city and street, environment, housing, mother's age, literacy, married history, manner of feeding the infant, occupation of the mother, the family earnings, etc. This most valuable report gave in a concrete way all that they had known before in a general way and pointed out how many infants could become strong and develop into useful members of society. Since the problem was an economic one it became the duty of the State to provide the necessities for healthful living if the parents were unable to do so. The lowered death rates in the slums of foreign cities had been the result of governmental aid in the construction of sanitary houses and the making of living conditions more favorable. The advantages of playgrounds, school lunches provided in some cities, and the classes for teaching girl pupils, the care of infants were all considered.

There the ravages of war, and the results of the hasty marriages encouraged by authorities, and the want of the necessities of life, would all show in an offspring mentally and physically weakened and the infant mortality would be correspondingly high. Our country could not be expected altogether to escape the influences of the war in this respect. With the increased demand for food stuffs and the soaring prices, the children of the poor would be deprived of the requisites for normal nutrition. That much could be done to lessen this evil had been shown by Professor A. Pinard. He stated that the infant mortality in Paris was 21 per cent. less during the first six months of the war as compared with the same period of the preceding year, and that maternal mortality also decreased proportionately during the same period. He attributed these results to the measures taken by the Maternal and Infant Aid Society organized at the beginning of the war. Dr. Acker called attention to the danger of contact infection with tuberculosis during child life as having been too much neglected and also to the mistake of placing too much emphasis on the destruction of infectious material at the expense of building up of individual resistance by good food and proper hygiene. Health officers should have ample authority to remove infants from an environment which was dangerous to more sanitary surroundings. That the infant constantly exposed to tuberculous infection from its parents or other members of the family was just as much entitled to protection as when suffering from tuberculosis, as the authorities would promptly give it were the disease smallpox or diphtheria seemed to the writer perfectly rational—surely the danger was almost as great. Dr. Acker lamented the chaotic condition of the principles of infant feeding, which left the student, when he had completed his course at a medical college, confused as to the most important subject in the whole realm of pediatrics. He felt quite convinced that by a united effort a reform could be brought about.

In closing, Dr. Acker considered the needs of the Society, and while congratulating them for the high standard that they had maintained suggested that their membership could be enlarged with advantage to the many other men in their special line of work and also to themselves. He suggested that they might provide an associate membership from which men could be advanced to full standing upon a basis of merit. He expressed the fear that they might be turning rather too exclusively to the laboratory side of medicine, with a consequent neglect of the clinical work, and felt that they should preserve a proper balance, their membership being made up both of clinicians and of laboratory men. There were many men lending great efforts to the advance of pediatrics, but in a clinical way, and he felt that they were in a splendid position to verify the work of those who by inclination and opportunity were engaged in original research.

CUBIC AIR SPACE FOR INSTITUTIONAL BOTTLE-FED INFANTS

Dr. Thomas S. Southworth, New York, said that in New York State the law prescribed a minimum of 600 cubic feet of air space per inmate in institutions for children, and that while ventilation was a nominal requirement, such ventilation was neither defined nor enforced. There was no apparent evidence that the laws and rules were based on competent pediatric authority, but rather that they had come about through custom and compromise. In the hope of securing some definite data of value and authority, a questionaire was sent by the writer to each member of this Society, the inquiry being restricted as far as possible to bottle-fed infants under one year of age, unaccompanied by their mothers, since these infants constituted the most vulnerable group, in which there was admittedly the largest mortality. After stating the question that had been asked and analyzing the answers received, Dr. Southworth concluded as follows:—

(1) The majority of the hospitals and institutional wards for infants from which reports of cubic air space were received provided 1,000 cubic feet of air space and upward for each inmate, and only five reported 600 cubic feet or less.

(2) Even with 1,000 cubic feet of air space free ventilation was deemed highly important, and as the space decreased such free ventilation became more and more imperative.

(3) No allowance of cubic air space was at present made for the necessary attendants in the wards.

(4) Reduced cubic air space meant less square feet of floor space and less separation between cribs, with proportionately increased opportunity for the spread of cross infections. There was a growing belief that even with free ventilation separation of the beds played as important a rôle as cubic space. Such adequate separation, however, was only attainable with large cubic air space.

(5) On account of their handicaps, bottle-fed babies were certain to require more space than nursing infants.

(6) Bottle-fed infants required as much cubic space as so-called sick or "medical" or "surgical" cases among infants.

(7) The majority of pediatric physicians believed that infants should have as much cubic air space as adults, if not more, and that was especially true of bottle-fed infants because they were more susceptible to infection, suffered in their nutrition in confinement, and notoriously did badly in all save the best equipped institutions.

(8) Bottle-fed infants when retained for any considerable length of time in hospitals or institutions cannot properly be classed as well infants because a considerable proportion of them suffer both in their digestion and nutrition, as well as from intercurrent affections, and therefore require unusual attention in their feeding and general care.

(9) Limited cubic air space, involving limited floor space, is an important contributory factor in the high mortality of artificially-fed infants, and such crowding in limited space was

very commonly the concomitant, if not itself the cause, of faulty hygiene, insufficient care and inadequate nursing.

(10) Even with a liberal allowance of cubic air space, free and abundant ventilation was of equal importance. In addition, provision for roof-gardens, porches and sun-parlors was advisable if not imperative.

(11) The mere presence of windows does not of itself constitute ventilation, but their proper use must be provided for.

(12) A low minimum of cubic air space established by law, without definition of what constitutes efficient ventilation and without enforcement may be more harmful than beneficial, and may constitute a virtual license to overcrowd in ill-ventilated wards.

(13) The example of the more progressive hospitals and institutions which provide the larger amounts of air space per infant, together with free ventilation, was to a considerable extent nullified by state and local regulations, licensing for the less progressive, the employment of minimum air space (contrary to the majority opinion of those best qualified from experience to judge) for a class of infants among whom there was admittedly an unduly high death rate.

Dr. L. Emmett Holt, New York, said that Dr. Southworth had done a service in formulating and putting in a concrete way the needs for study along this line. The problem was a difficult one for pediatrists, since so much depended on the cooperation of hospital authorities. It was a question in New York whether children having hospital care did better in separate institutions or in a special department of a general hospital. He thought children were better off in a special institution in some ways, since they required a special kind of care, and in institutions for the housing of children a special construction was desirable. However, there were some advantages in a large general hospital, among which were training schools for nurses, opportunities for consultation with physicians in other special departments of the hospital and opportunities for the training of internes that would give them experience in dealing with children's diseases. The problem was which, on the whole, the general hospital or the special institution for children, offered the greatest advantages for the child. Dr. Southworth had put in a general way the requirements essential for children in institutions as regarded cubic air space. Children needed from two to three times as many nurses as would be required for the same number of adults.

Dr. Rowland G. Freeman, New York, said that in the matter of cubic air space what the child in the ward needed was free moving air from the windows. Out-of-doors was better than in, for even with the windows open the circulation of the air in the ward was dependent on the amount of wind, or circulation of the air outside.

As to the comparison between the advantages and disadvantages in general hospitals and children's hospitals, Dr. Freeman said he could speak, as he had had experience with both. The disadvantages of the children's hospitals were due to the fact that they had all grown from nurseries and foundling homes and one did not have the same advantages in studying a variety of cases that one had in the general hospital, neither did one have the advantage of contact with men in other departments which enabled him to become familiar with methods that were being applied to adults that might also be applied to children.

Dr. L. E. La Fétra, New York, said there were many other factors besides the cubic air space that had to do with the welfare of infants in institutions. In Bellevue Hospital the cubic air space per infant varied; it was not less than 700 cubic feet in any instance and in one ward there was as much as 1,500 cubic feet per infant. The fewer babies there were the better they did, and that brought up another point, namely, that with the same air space the breast-fed infants did better than those artificially-fed. Another factor that entered into the matter was that when more babies were admitted to a ward more nurses were not added and the amount of individual care and mothering the babies received had a very important bearing on their welfare. Still other factors that might be mentioned were the need of sun-parlors, balconies, roof-gardens, etc., and the fact that there was frequently inadequate nursing at night. It should also be emphasized that beds should be far enough apart not to be within striking distance for infections.

Dr. S. McC. Hamill, Philadelphia, said that with reference to the question that Dr. Holt brought up a great deal depended on the hospital authorities and management as to what kind of accommodations could be secured. The special institution for children seemed to be the more valuable method at the present time, though if the hospital authorities provided proper conditions and sufficient wards to care properly for the children, they would do as well in a general hospital. At Johns Hopkins they had a children's hospital which was practically a part of the general hospital, that was, it was administered as a part of the general hospital. The question really resolved itself into one of hospital administration.

Dr. Henry L. Coit, of Newark, said that the point that was interesting to him was that artificially-fed infants needed as much cubic air space as adults, and this must be due to the fact that the atrophic infants radiated heat rapidly. With this type of infants one had to be more careful as to the ingress and egress of air, and the air should be warmer than for normal healthy infants. Many institutions were not properly equipped for ventilation and had to depend on windows. With these atrophic infants radiating heat rapidly a proper balance could not be obtained by window ventilation. They had tried to get 1,000 cubic feet of air space per infant. In determining air space some allowance must be made for the physical condition of the child and its capacity for maintaining heat.

Dr. Fritz B. Talbot, Boston, said he took exception to one thing Dr. Coit said in reference to atrophic infants. In comparing the heat radiation of atrophic and normal children they had found that in atrophic infants the subnormal temperature was not due to radiation from the skin, but to the fact that the engine did not make enough heat to keep up the temperature and heat had to be supplied from the outside.

Dr. Samuel S. Adams, Washington, said that securing proper ventilation depended on a great many things. A competent architect was one of the essentials. Another point was that if one could not get the requisite in the way of proper hospital construction from the managers, it was sometimes possible to do so by appealing to the ladies' board. He related an instance in which he had been successful by resorting to this method. In speaking of exercise for sick babies in hospitals, he said it was impossible if one gave from eight to twelve babies to one nurse, to expect her to have time to carry the babies about and give them the exercise they should have. They had adopted a plan of having the mothers come and take the babies out in the afternoon and also in having nurse-maids employed for this purpose. The babies that had this exercise undoubtedly did better than those that did not. They should insist that children in hospitals should have an equal chance with adults.

Dr. Southworth said that he agreed with the speakers who thought that the welfare of the children was not so much a question of cubic air space as of other things. But by getting sufficient air space they could get regulations that would prevent overcrowding. A great many of the answers that came in indicated that windows were opened where there were marasmic children. During a great part of the winter the windows could not be kept open and these marasmic babies be kept warm. There was a growing belief that babies should not be kept in foundling hospitals, but were better off if boarded out. It was noticeable that in the two states that were making the greatest effort in this direction the laws required the least cubic air space in institutions for infants.

PARAPHARYNGEAL ABSCESS AS DISTINGUISHED FROM RETROPHARYNGEAL AND PERITONSILLAR ABSCESSES

Dr. Henry Heiman, New York, said that while ordinarily retropharyngeal abscess was easy to diagnose there was a class of cases in which incision yielded little or no pus, the symptoms of fever and pain on swallowing continued, the patient became more septic in appearance, and the tumefaction within the oral cavity remained the same, while the external swelling usually increased in size. The signs might continue unabated or might become progressively worse, even after repeated, usually unsuccessful, incisions from within the mouth, until a deep external operation was done, when, as a rule, considerable pus was evacuated and the patient recovered. It was with the view of classifying these cases and clarifying this phase of the subject that this paper had been written. The essayist stated that it would be readily understood from an anatomical point of view how any inflammation of the rhinopharyngeal mucous membrane might be followed by a parapharyngeal as well as a retropharyngeal abscess. Although the etiology of both conditions was practically the same, it was his observation that the retropharyngeal type was most likely to occur after the ordinary rhinopharyngitis, while the parapharyngeal type usually followed influenza, tonsillitis, scarlet fever, measles, and other infectious diseases. Retropharyngeal abscesses occurred nearly always in infancy, as the retropharyngeal nodes were supposed to atrophy after the third year of life. The parapharyngeal abscesses involving, as they did, the lateral lymph chains of the pharynx, were more common after the age of three, and probably occurred more frequently than was supposed, owing to the fact that they might be mistaken for the ordinary retropharyngeal variety. The so-called parapharyngeal abscess was differentiated from the retropharyngeal abscess by the fact that its site was by the side of or lateral to the pharynx, while the retropharyngeal abscess, though it might produce a central bulging, was usually somewhat lateral to the mid-line; it did not displace the tonsil and was, as a rule, accompanied by edema of the pharynx and uvula, a brassy voice with symptoms of more or less laryngeal stenosis and at times by a retraction of the head. On palpation a distinct cushion-like feeling of fluctuation might be obtained. The parapharyngeal abscess produced bulging near the lateral wall, if at all, internally, but rarely in the mid-line; it nearly always displaced the tonsil, and this was an important point, toward the median line, and was rarely accompanied by any marked local change in the appearance of the pharynx or by any symptoms of pressure on the larynx. In the case of retropharyngeal abscess internal incision usually cured, unless the suppuration extended to the lateral columns of the pharynx, at which stage the retropharyngeal abscess became a parapharyngeal abscess and then required an external incision, or burrowed its way into the mediastinum. The retropharyngeal abscess was usually diagnosed early, while the parapharyngeal abscess might progress for one or two weeks before a diagnosis was made, or before the external swelling became sufficient to warrant an external incision. Of importance also was the age of the patient; an abscess in a child over three years of age being more likely to be of the parapharyngeal type. Parapharyngeal abscess was distinguished from peritonsillar abscess from the fact that in peritonsillar abscess there was a marked redness of the soft palate and a swelling above and to the inner side of the tonsil pushing forward the anterior pillar of the fauces. This abscess pointed within a few days and ruptured spontaneously or required incision. The tonsil was not usually displaced inward, as in the parapharyngeal type; the course was not a matter of weeks and there was no external swelling. Parapharyngeal abscess was differentiated from interstitial or tonsillar abscess in that tonsillar abscess might follow a severe tonsillitis, involve the tonsils alone, and, as a rule, did not push the tonsil toward the mid-line. They caused a marked tumefaction of the tonsil itself, but never an external fluctuating mass. From cervical adenitis occurring in the course of the infectious diseases parapharyngeal abscess was distinguished by the fact that in cervical adenitis the superficial glands of the neck were involved and the process rarely spread to the deeper lymphatic structures. There was, as a rule, no suppuration and consequently slight prostration, and, lastly, there was never any pushing inward of the tonsil. In the treatment of parapharyngeal abscess repeated internal incisions frequently failed to cure and an external operation with drainage was, in the opinion of the speaker, the ideal method.

Dr. Wilder Tileston, New Haven, Conn., said he had just seen a case of pharyngeal abscess involving the lateral lymph nodes in which the abscess perforated internally, contrary to the rule Dr. Heiman had laid down, and without external incision.

Dr. Thomas S. Southworth said peritonsillar and parapharyngeal abscess were likely to be confused, but as Dr. Heiman had said, in peritonsillar abscess there was more swelling of the tonsil, but not an external fluctuating mass. In these two groups there were border-line cases, but it was interesting to note the vague swelling without any particular outline in peritonsillar abscess before one could feel the glands and state that an abscess was there. The abscesses grouped under these two heads sometimes pointed inside and sometimes outside. He had seen one come just inside under the mucous membrane of the pharynx. Dr. Southworth said he wished Dr. Heiman would state whether these parapharyngeal abscesses point externally or whether one has to go down after them as after those secondary to scarlet fever.

Dr. L. E. La Fétra, New York, said he would like to add his testimony to what had been said in reference to the swelling. It might be below and to the inner side of the tonsil in peritonsillar abscess. He wished also to say that parapharyngeal abscesses could certainly be opened from within if the cases were such as he understood were included in the parapharyngeal group. Many cases which were not peritonsillar and not retropharyngeal and in which there was a large amount of swelling on the outside and the pharynx pushed the tonsil in toward the mid-line could be better opened from within. Another point was that in these cases in which there was a large amount of swelling and the tonsil was pushed in one need not be in too great a hurry to operate, since, if expectant treatment was employed, hot irrigations, etc., they might open of themselves.

DR. WALTER LESTER CARR, New York, expressed the opinion that it would sometimes be found difficult to make distinctions according to this classification. He recalled a meeting where this subject was discussed and the surgeons were all in favor of an external operation, while the medical men thought these abscesses could be reached internally or could be brought to a point by irrigations. The paper had not told them definitely when a case was suitable for a general surgeon and when it was proper to use a small incision, an operation such as could be done by any of them. But of course the operation that would give the best drainage, whatever the form of infection, was the preferable one.

DR. J. P. CROZER GRIFFITH, Philadelphia, said he would like to ask the members if their experience was the same as his had been with the abscesses. Dr. Heiman had said that the diagnosis of retropharyngeal abscess was easy, but from his experiences which he had had in consultation with general practitioners, he had been led to believe that it was not so very easy. In one case the physician who called him in said he had never seen a retropharyngeal abscess before. He also related an early experience with a case in which he made a diagnosis of abscess in the pharynx and asked a surgeon to operate. The surgeon was skeptical as to the presence of an abscess, but was finally induced to operate, and, on making the incision, found the abscess as Dr. Griffith had predicted.

DR. HEIMAN, in closing the discussion, said that in reference to Dr. Tileston's question, he had stated that these parapharyngeal abscesses did sometimes rupture spontaneously; he had mentioned one case of that kind. Both the superior lymph chain and the deep cervical glands might become infected and the patient might recover without operation. In his conclusions he had left a loophole by saying, "As a rule, these abscesses were cured only by operation." With reference to Dr. Southworth's remarks, he had said in the paper that the parapharyngeal type of abscess usually followed tonsillitis, scarlet fever and other infectious diseases. Again, the parapharyngeal abscess was much slower in developing, while the peritonsillar abscess developed in from twenty-four to forty-eight hours and involved Rosenmuller's fossa. With reference to Dr. Porter's question as to the involvement of the superficial glands at the angle of the neck—in the paper he had said in cervical adenitis the superficial lymph glands of the neck were involved, but the abscess pointed out and the tonsil was not deflected toward the median line.

A CONTRIBUTION TO DUCTLESS GLAND THERAPY

Dr. Royal Storrs Haynes, New York, related the history of an abnormal child whose case was of particular interest in demonstrating the certain activities of the pars intermedia of the pituitary gland. This patient was brought to the dispensary of the Babies' Hospital September 1, 1905, at the age of three years and eight months, at which time a diagnosis of cretinism was made. The child was put on thyroid in small doses. She gained rapidly and steadily in weight and height and intelligence. At the end of two years she was bright and intelligent, with a closed fontanel and a not greatly protuberant abdomen. Enuresis was noted at the end of this period. Shortly after this it was observed that she was not as bright and the dose of thyroid was increased. At the age of eight years she came directly under the charge of an assistant in the clinic, who thought she needed more thyroid and increased the dose accordingly. She had at least 10 grains a day during the entire year of 1912. This increase of thyroid was not productive of mental improvement and did result in a loss in weight. The child became nervous, irritable, of a poor mentality, and wet the bed every night. In 1913 she came under the direct care of the essayist, at which time she was a large child, though below the average weight. She had an excessive appetite and was excessively nervous, having a marked tremor. It was apparent that she was suffering from too much thyroid. The drug was omitted for a time with advantage to the patient. She received no thyroid during the spring and summer of 1913, during which time she improved greatly both mentally and physically. She seemed remarkably normal in every way, except that she showed some of her cretinism in her shortness, her lordosis, and her prominent abdomen. In September she had an attack of poor appetite and grayness, which disappeared under treatment with rhubarb and soda without thyroid. Another attempt to give thyroid drew the attention of the essayist to the necessity of having absolutely fresh gland and immediate dessication. During the latter part of 1912 it seemed that some other agency was at work or released by the withdrawal of the thyroid, because the patient's weight increased so rapidly and her general bigness, although her height had not. Her face was heavy, her fingers blunt, and she looked old and sullen. The possibility of pituitary gland involvement suggested itself and a radiograph seemed to show that the sella turcica was enlarged. By mistake, when they tested her tolerance for glucose, she received 250 grams instead of 150. Yet she retained it. Acting on the suggestion that an enlarged sella meant an enlarged pituitary, while the increased tolerance for glucose meant a deficient pars intermedia, they concluded that there was a hyperplasia of the pars anterior, causing enlargement of the face, hands and feet, and that this by pressure on the pars intermedia or its blood supply caused it to become deficient. Acting on this a preparation of pars intermedia was obtained in capsule form, each capsule being equivalent to 150 pounds of live bullock and the preparation being absolutely fresh. After taking the capsule for two weeks it was noted that her expression was brighter, as though something has been lifted from her countenance; her mouth was more closely shut, there was an increased smoothness of the skin and it was considerably thinned. In a month her face had lost its vacant stare and her skin was improved. The capsules were continued and by the following July there was a distinct change in her facial expression and her skin. Her fingers, which had been blunt, had become tapering; her hips were slender and shapely, and her lower extremities were straighter. The skin was soft and the hair oily. Secondary sexual development was taking place. This was not directly attributed to the therapy, but to the effect of disturbance of the pituitary upon the interstitial cells of the ovary. The pituitary had been omitted and then resumed at different times up to the present. The patient did not now appear to be an abnormal child, only a rather heavy, stocky one, very good-natured, and not sensitive to pain. Serial photographs showed her progress.

It seemed evident in this case that, assuming the deficiency of thyroid as evidenced by her condition when she first came under treatment, there was also an affection of the pituitary, which partook of the nature of a deficiency of the pars intermedia.

As to whether the pituitary had always been at fault, or whether the overdosing of thyroid had affected it or the withdrawal of thyroid had allowed it to assume an activity, were subjects of speculation. However, the pars intermedia therapy seemed to have been productive of a striking change.

Dr. Charles Herrman, New York, said that this case bore out his contention that frequently more than one gland was affected, and that there was a correlation between the so-called ductless glands. Assuming this to be the case, an extract composed of thyroid, suprarenal and pituitary was better than thyroid alone. As to cretinism, it was infrequent to see such a marked disturbance or such an acromegaly as was exhibited by the case which Dr. Haynes had just reported. As to the treatment of cretinism itself, they had formerly used only thyroid extract, but they were now using thyreo-protein, and the results were as good, if not better, than with the thyroid extract formerly used.

Dr. Griffith, Philadelphia, said he had under his observation a boy who was somewhat of a puzzle to him, in view of their lack of knowledge of internal secretions. This boy had a gigantism and both a hypo- and a hyper-activity of some ductless gland. He did not see how this could be unless there was something besides the pituitary diseased.

Dr. Haynes replied that such cases had been reported as that of Dr. Griffith. There might be an association of thyroid and pituitary disease, and there was a basis for this belief, since removal of the thyroid had been shown experimentally to result in hyperplasia of the pituitary.

THE ENERGY METABOLISM OF AN INFANT WITH CONGENITAL ABSENCE OF THE CEREBRAL HEMISPHERES

Dr. Fritz B. Talbot, Boston, stated that this baby entered the Massachusetts General Hospital October 24, 1913, when eight months of age. Two months before the mother had noticed that he was unable to sit up, hold his head up, or do as other babies of the same age did. He was said to be very quiet, gained weight rapidly and had always been breast-fed. The physical examination showed a large baby with a thick layer of subcutaneous fat. The muscles were felt with difficulty and seemed to be relatively undeveloped. His head rolled about constantly when he was held up. The anterior fontanel was slightly depressed, the posterior was closed. He was blind, the pupils were equal, of moderate size and did not react to light. Examination of the fundus showed optic atrophy with considerable cupping of the discs. He had an idiotic expression. The knee-jerks were equal and lively, there was no Kernig's, and no Babinski's or paralysis other than the muscles of the neck. The baby remained absolutely quiet most of the time and did not seem to notice anything. His actions gave the impression that he was deaf. The slightest touch on any part of his body resulted in crying, at times resembling laryngismus stridulus. The reaction to touch seemed more highly developed than in the normal infant. An operation for the relief of the blindness showed that the hemispheres of the brain were entirely absent and replaced by cerebrospinal fluid. At the base of the skull there were a series of nubs, none larger than a small walnut, the posterior of which probably represented the cerebellum; the optic nerve was recognized. About 8 ounces of spinal fluid was removed and replaced with normal salt solution. The pulse rate when the child was at rest was 69 to 70 per minute, during muscular exercise 120 to 140 per minute. He weighed 330 grams more than the average baby of the same age. The metabolism was determined in the apparatus described by Benedict and Talbot in "Gaseous Metabolism of Infants," Carnegie Institution of Washington, Pub. No. 210. Charts were presented in which the metabolism of this child was compared with that of normal infants of about the same age, weight and length. The metabolism of this child was extremely low in comparison with the two normal infants. Although periods of minimum muscular activity were sought for, the data showed that no period had a relative activity less than two and the values were determined with some visible recordable activity, as shown in the graphic records, while the values recorded for normal infants in this comparison had much less activity. This accentuated even more the extraordinarily low value for this child, since the increased activity would obviously result in a somewhat higher heat production than he would have had had he remained absolutely quiet. His minimum metabolism was relatively lower than that of a n born babe and of several fat infants none of which produ less than 42 calories per kilo body weight. Since this c was deprived of volitional areas of the brain, his life similar to that of the frog in which the cerebral hemispheres been removed. He therefore did not develop musculature would a normal infant, and as a result his body was made principally of fat and bones with a small amount of muscle. temperature remained constant during the time of observat The vital functions of this infant were carried on at a very plane because his existence was purely reflex. Unless some ternal stimulus caused him to move there was little or no mu lar activity, and as a result only a small amount of fuel necessary to keep the furnace going.

DR. JOHN HOWLAND, Baltimore, said he had, in his abolism studies, reported a case somewhat comparable to His child was eight years old when first seen and weighed 13 pounds. His condition was the result of spinal mening His metabolism was very low, as he had almost no muscles which to make heat and his weight was almost entirely in parenchymatous organs and in the skeleton. The results of metabolism observations were nearly comparable to those sented by Dr. Talbot.

DR. WILDER TILESTON, New Haven, said he was intere in the clinical aspect of this case and would like to know if th were any epileptiform seizures, chronic spasticity, tachyca and increased respiration.

DR. TALBOT, Boston, replied that there were no changes in respiration and no nervous symptoms, except that when the c cried he made a sound suggestive of laryngismus stridulus. Howland's case was very interesting. Dr. Talbot said he one other unreported case of lethargic cretinism. He had the child in the baby box and his metabolism was almost as as that of the case just reported.

REPORT OF CASES OF VARIOUS TYPES OF IDIOSYNCRASY TO MI

DR. E. W. SAUNDERS and DR. T. WISTAR WHITE, of Louis, gave the clinical history of 12 cases of infants show idiosyncrasy to milk and apologized for presenting such a n of clinical material without the accompanying laboratory work. Those cases characterized by vertigo on the administration of the least amount of dried milk put into the bread must certainly be classified as idiosyncrasy to milk. The most serious cases were the exclusively breast-fed infants with a family history pointing to this idiosyncrasy. These often proved fatal in a first attack and thus eluded the diagnosis based on cyclic vomiting; moreover, vomiting might be almost absent from the syndrome. Idiosyncrasy to milk might be shown during the early months of life or might be developed at a later period. It might continue through life or it might cease. It might be partial, depending upon the amount and the form of administration. If a baby did well on an ordinary feeding problem for a time and then reacted disastrously toward the whole, or toward a certain constituent, it might fairly be termed an idiosyncrasy, especially if this peculiarity could be traced through subsequent childhood. In conclusion, the writers urged individualization in the dietetic treatment of infants and in critical cases of deleterious effects from milk, the recourse to cereal foods, in spite of the fear of chronic dystrophies ensuing.

ALLERGY TO COMMON FOODS

Dr. Oscar M. Schloss, New York, reported his observations derived from a study of 43 cases of food idiosyncrasy. Among these there were cases of idiosyncrasy to milk, egg, beef, horse protein, wheat, rice and other cereals and food stuffs. It was unusual to find the idiosyncrasy confined to a single food substance, but as a rule it was confined to several of those enumerated. Among the most frequent symptoms due to food idiosyncrasy were urticaria and angioneurotic edema. In some of the severer types of food idiosyncrasy these symptoms followed immediately after the ingestion of the toxic food, affecting the lips and buccal and pharyngeal mucous membranes. The more remote form might follow within one-half to three hours after the food was ingested and might involve the entire body. The relationship of eczema to food allergy is of great interest. During the past two and one-half years Dr. Schloss said he had observed 18 cases of pronounced eczema and in every case a cutaneous reaction was caused by the proteins of one or several foods. In many instances the withdrawal of the food to which the most striking disturbances were due was not followed by disappearance of the eczema, but since the cutaneous reactio was practically always manifested toward several foods it wa quite possible that the eczema might be due to some unsuspecte food substance. That the relationship of the foods to the eczem might be causative was attested by the therapeutic results demor strated in the cases reported.

A second group of toxic disturbances consisted of asthm or asthmatic bronchitis. Cases of asthma provoked by the ingestion of egg were not uncommon, and while asthma might be du to the ingestion of other foods the relationship was far fror constant, and in a number of cases in which such a relationshi was suspected investigation gave only negative results.

A third group of symptoms were gastroenteric in origi vomiting, pain and diarrhea, and were probably due to the direc irritant action exerted by the foods.

In a fourth group the food idiosyncrasy was indicated b the blood reaction, which consisted of eosinophilia. In a number of cases of food idiosyncrasy the essayist had observed marked increase in the eosinophile cells at the time of, or directl following, toxic food disturbances. The charts presented demor strated the regularity with which this phenomenon occurre

With reference to the cutaneous reaction, Dr. Schloss state that in the more pronounced cases simple massage of the foo or protein into the skin caused the appearance of crops of urt carial wheals. Inoculation of the food or protein into a ski abrasion caused the appearance of an urticarial wheal sur rounded by a zone of erythema. The reaction was characteristic and so far as had been determined occurred only in cases o food allergy. Unfortunately, a cutaneous reaction was not a ways present, but in some cases an intracutaneous injectio would provoke a reaction, although the cutaneous test was negative. An observation of interest was the fact that the cutaneou reaction would often disappear during and directly followin toxic food disturbances. It was also to be noted that in som instances equivocal skin reactions occurred so that the dividin line between negative and positive became very fine. Such ir stances were few, however, and further study might eliminat them. In all cases in which the essayist had made complete test he had found that the offending food constituent was the protein. Numerous experiments in anaphylactic shock had show that when an animal recovered from the intoxicating dose of protein it then became immune to further injections. This immunity, however, was only temporary and within one to three months the animal again became sensitive to the protein to which it had been treated. In human beings it had been noted that patients once immunized to egg did not remain immune unless egg in comparatively large amounts was administered continuously. In 6 patients the immunity seemed to be lost in from three to six weeks, when the further ingestion of egg protein in gradually increasing amounts again produced immunity. On 2 patients definite experiments in relation to anti-anaphylaxis were conducted. In both urticaria following the ingestion of egg appeared within one to three hours. Following this the reaction to egg protein became negative, but only to become positive later on. These observations served to show how anaphylactic disturbances might be cyclic even though the food causing the disturbance was injected continuously.

In some instances the food idiosyncrasy was inherited, while in others it was acquired.

The diagnosis of food allergy was made either clinically or by the cutaneous reaction, and the treatment must vary according to the type of the idiosyncrasy. The ideal method was that of desensitization by the administration of gradually increasing amounts of the toxic protein. The second method was that of eliminating the offending articles from the diet. Often the two methods might be combined with advantage. After speaking of the difficulties of treating eczema and asthma of allergic origin, Dr. Schloss concluded that the recognition of food allergy as the cause of these conditions enabled one to arrive at a rational treatment. At present his own experience did not warrant the assertion that a satisfactory result could be obtained in all cases in which it was reasonable to suppose that the disease was of food origin. It seemed probable, however, that this was due to the lack of satisfactory substitute foods and to the difficulties in obtaining a distinct cutaneous reaction in all cases.

Dr. John Howland, Baltimore, stated that during the last few months Dr. Blackfan had investigated 23 cases of eczema. Almost all of them were sensitive to one or more proteins; almost all were sensitized to egg, many to milk, and two or three to cereals. Dr. Blackfan's experience was like that of Dr.

Schloss. It had been impossible to produce passive immunity and tests showed no precipitins in the blood. These children responded rapidly to treatment, but there was usually a return of the symptoms. Among the older children there were 1 or 2 entirely cured. Therapeutically, a small number could be definitely helped, while a large number could not be improved in any way.

Dr. Fritz B. Talbot, Boston, said he had been following Dr. Schloss' work ever since he read his paper on this subject in New York three years ago and had been making observations of his own. His results had been the same as those of Dr. Schloss. The longest time a patient remained absolutely cured was three years; several children had lost the skin reaction. He had seen a large number of cases of asthma recently and about 60 per cent. gave a positive skin test to some food. He had found that egg was most commonly the offending article, and with egg allergy there was sometimes a positive reaction to nuts and of these especially English walnuts. In several instances he had made the tests with different kinds of nuts; more frequently the peanut was the one that did not produce a reaction when the others did. Many that reacted to egg were also sensitive to horse serum. There were several who reacted to nuts, beef juice or milk, but were negative to egg. He had had the same experience that Dr. Schloss had had: that those that reacted positively to hen's egg also reacted positively to duck's and turkey's egg. In a majority of the cases there was a definite history of intolerance either in the father or the mother, or both. When they had been able to immunize a child to a definite protein, the resulting effect on the eczema was striking. But in many children it was difficult to work up a tolerance to a certain protein. In one child he worked up to 10 milligrams, but every time he went higher he brought on an attack of asthma, which put the child back for a week. When he got above 75 milligrams there was a definite improvement in the condition of the child and there was a diminution of the duration and severity of the attacks.

Dr. John Lovett Morse, Boston, asked Dr. Schloss if he thought every case of eczema and urticaria was due to food allergy.

Dr. Tileston, New Haven, said that Dr. Schloss' work promised to throw a flood of light on many obscure skin diseases; some had already been shown to be due to anaphylaxis. Possibly aphthous, stomatitis and the visceral complications of erythema might be shown to have anaphylaxis as a basis.

Dr. S. McC. Hamill, Philadelphia, said they were attacking this problem in a slightly different way. They were taking children in a condition of moderate ill health, having manifestations chiefly referable to the gastrointestinal tract, and trying a number of proteids by the puncture test. They used the protein of egg albumen, cow's milk, beef, mutton, fish, etc., to determine for which one an intolerance existed. At present he had a case of asthma which reacted to all of the proteins thus far tried, but most strikingly to egg albumen. The child had been having attacks of asthma each day; when the egg white was stopped these ceased for ten days and then recurred. By the application of other tests they found that the child reacted to milk and that was removed from his diet. The attacks of asthma, however, had not stopped entirely. By working back from the history of the case and testing the child's reaction to different proteins one might find some reason for the condition of ill health.

Dr. Haynes, New York, said he had treated several of these cases of food allergy with asthma and eczema. In some of these cases there was an intolerance for chicken as well as egg. Whenever diet was transgressed one of two things happened—either there was a return of the eczema with a slight indiscretion, or the child would develop a persistent cough when it did not get an attack of asthma. Both manifestations disappeared on withdrawal of egg.

Dr. Henry Heiman said he would like to know whether this intolerance to egg existed for all egg or for a certain type of egg, and how Dr. Schloss applied the cutaneous test.

Dr. Freeman, New York, said that many children who were thought to have an idiosyncrasy to milk were taken off milk and kept off this diet permanently and were thus injured by not having a well-balanced food. He had found it possible, acting on the suggestion of Dr. Schloss, to obtain tolerance to milk in such children by giving a very little at first and increasing the amount as the tolerance increased. Such children could often eventually take a normal amount of milk.

Dr. Griffith, Philadelphia, asked if possibly other food constituents might have the same effect as proteins, since in some instances a large amount of carbohydrate in the form of sugar had appeared to bear an etiologic relation to eczema.

Dr. Isaac Abt, Chicago, said that while some foods were badly taken care of by the system and gave toxic symptoms, this was not a question of the food, but of some peculiarity in the child and they now had no means of designating or classifying such peculiarities.

Dr. Oscar Schloss, New York, in closing the discussion, emphasized the point that it was only in severe cases of food allergy that he had been successful in producing passive sensitization. The permanence of the cure in eczema depended on obtaining immunity, and in instances of recurrence one sometimes found a child sensitized to a protein that he did not know of before. As to Dr. Morse's question, he was not in a position to answer it satisfactorily. Eczema, in some cases, was considered to be due to intolerance to fat and sugar, and such patients recovered by eliminating these articles from the diet. Of 23 cases of eczema 16 gave a positive reaction to some kind of food. As to asthma, he would not say that it was always due to food allergy; asthma was a disease of multiple etiology and might have other origins, and in only a small percentage of cases did one get a definite indication of a food origin. At the time he had made his first report on this subject, Dr. Schloss said he had tested 75 or 80 institutional children as controls and got no reaction. Dr. Talbot had also found that he got only two reactions out of 100 tests and one of those was an infant with eczema. In 2 of his cases of idiosyncrasy for egg, Dr. Schloss had tested the children with different types of egg and found that they reacted to other types of egg as well as to hen's egg. As to the method of using the proteid to make the skin tests, they extracted the proteids from different foods and used them pure or in solution. Dr. Schloss described this process. The reaction took place almost immediately and lasted only a short time. With reference to Dr. Porter's question as to the origin of the sensitization and whether it was possible to produce it through the intestinal tract, they had injected certain foods in animals for a period of time and found that when they had ingested a certain quantity sensitization would be produced, so it seemed that sensitization could be brought about through the intestinal tract. As to urticaria, Dr. Schloss said he would not say that all urticaria was due to food allergy; this, too, was a disease of multiple etiology, but many cases of urticaria were due to protein intolerence.

ENERGY METABOLISM OF A TWO-MONTHS-OLD CHILD FED ON A PROLONGED PROTEIN-RICH DIET

DR. RAYMOND HOOBLER, Detroit, declared that the problem of determining the optimum quantity of protein necessary for the growing organism had been the subject of numerous investigations. The injury, if any, of feeding large quantities of protein to an infant had not been studied to the extent it deserved, and it was on this subject that the experimental work detailed in this paper was carried out. The average breast-fed infant was subject to much less disturbance in protein supply than the average artificially-fed infant. As Dr. Howland stated in his Harvey Society lecture: "There is every reason to believe that the amount of protein furnished a healthy nursing infant represents at least a sufficient quantity and cannot be much in excess. However, since only 80 per cent. of the nitrogen of human milk is available (the other 20 per cent. being in the form of urea and other extractives), one may, when feeding cow's milk where practically all the nitrogen is available, reduce the quantity of protein to an amount equal to 80 per cent. of that supplied by mother's milk." Rubner brought this point out clearly when he suggested that the diet of the growing infant was relatively poor in protein. The question arose, "Can any harm come to the growing organism through the feeding of an excess of protein?" To answer this one must inquire as to the various changes which protein undergoes in its transition from an external food product to the cell of the living organism. The essayist followed out this process and stated that Rubner believed that the excess of nitrogenous intake was merely consumed instead of an equivalent of non-nitrogeneous food. In his experimental work the writer had used the Atwater Benedict calorimeter. According to a plan outlined by Professor Lusk, it was decided to begin with a low protein diet and determine basal metabolism for this child and then to gradually increase the protein content relatively and actually, maintaining the fat and carbohydrate content as nearly on a level throughout the experiment as possible. The child was under observation sixteen days, being in the calorimeter two or more hours daily, from March 24th to April 10th inclusive, except the two Sundays. In all, thirty-seven periods of one hour each were studied. There was a perfect determination of the caloric as well as of the protein intake. Incidentally this revealed some startling discrepancies between the supposed and the real value of milk formulas and indicated the very great necessity of actually determining the caloric value of food by bomb calorimetry in all metabolic experiments. The infant chosen for these experiments was a healthy infant two months old. The first four days he was fed on one-third whole milk with 5 per cent. dextro-maltose, during which time the basal metabolism was determined. The child was then placed for one day on slightly increased protein and the following day was put back again on basal metabolism diet; this continued each alternate day, gradually increasing the protein intake, until the last five days of the experiment, when the child was placed on maximum quantities of protein in the form of *eiweissmilch*, prepared at the Walker-Gordon Laboratory. The protein on certain of these days was increased by the addition of nutrose, and on the last day double strength *eiweissmilch* was fed. The clinical condition of the child was normal up to the last two days of the series, when it was noticed that he no longer took an interest in his surroundings, would not smile and play and seemed gradually to be in a semi-stupor when not sleeping. The pulse was slower, and there were times when the respirations were decidedly irregular. The stupor continued for three days after the experiment was closed, then gradually lessened, so that within one week the child was normal again.

From these observations the essayist concluded that: (1) Protein retained for growth causes no increase in metabolism. (2) Protein oxidized causes an increase in metabolism varying with the amount oxidized. (3) The cause of the increased metabolism is the stimulation produced by the amino acids and their products, derived from protein decomposition. (4) When large quantities of protein are fed along with insufficient carbohydrates and fat, even though ample calories to cover caloric need may have been given, there is a drain on the fat and carbohydrate stored in the body. Protein food, though greatly in excess, cannot be substituted for the need of fat and carbohydrate. (5) The proportion of protein fed as advised and taught is much in excess of the need.

Dr. Howland, Baltimore, said that this work of Dr. Hoobler's was interesting in showing the deleterious effects of high percentages of protein. In his own work presented four years ago he showed that protein acted as a stimulant to general metabolism, and while more protein could be consumed, glycogen was stored up above the normal amount, and in a general way it might be stated that the injurious effects of other food constituents was increased. In feeding large amounts of protein they had studied the mineral metabolism for two or three periods and found an abnormal retention of calcium, magnesium, phosphorus, potassium, etc.

Dr. Talbot, Boston, called attention to the curious fact that was brought out in their observations that when the increase in protein was given in the form of the protein of cow's milk the symptoms due to the increase of protein were visible much sooner than when other forms of protein were administered. He did not know why this should be. In attempting to make an investigation to see what principle was involved, he gave protein to a baby up to 4 per cent., when the baby developed symptoms of indigestion and the period during which he should have obtained results was lost.

A FURTHER STEP IN THE ADAPTATION OF AN ARTIFICIAL FOOD TO HUMAN MILK

Drs. H. J. Gerstenberger, H. D. Haskins, H. H. McGregor and H. O. Ruh, Cleveland, described their use of Friedenthal milk and the Bardt milk and stated that they had started out with the idea of making a fat for Friedenthal's milk that would meet the following requirements: First, approximately the same per cent. of low fatty acids as were contained in breast milk, and, second, approximately the same saponification, Reichert-Meissl iodin numbers, etc. Dr. Gerstenberger then came across a statement of Arnold's to the effect that a mixture of 86 per cent. lard and 14 per cent. cocoanut oil of certain saponification, Reichert-Meissl and iodin numbers would give a mixture containing the same numbers that were found in breast-milk fat. Such a fat would float on the top of Friedenthal's milk unless homogenized. They then learned of Nieman's method of washing and emulsifying butter. The authors found, however, that practically no fatty acids were removed by repeated washing of butter with cold water; that an emulsion of the fat could not be obtained when it was added to Friedenthal's milk; that Nieman was enabled to emulsify his mixture because he added a large percentage of cereal in the form of cornstarch; that washing butter oil with hot water removed but slightly more of the low fatty acids; that this amount was so small as to be negligible; that it was impossible to rid process butter, with which the authors worked, of the rancid odor and make it useful. The Walker-Gordon Laboratory having acquired a large homogenizer, the Friedenthal milk with both cold water washed and hot water washed butter was put through this homogenizer and perfectly homogenized. Most of the infants fed on this milk vomited and had thin yellow or yellowish stools. The authors then prepared a mixture of lard and cocoanut oil, according to Arnold's suggestion, added this to Friedenthal's milk and found that it was also perfectly homogenized by the homogenizer. Various combinations of lard, cocoanut oil, cod-liver oil and cocoa butter were prepared, added to Friedenthal's milk, homogenized, and fed to various infants. The clinical observations were not long enough to be deemed worthy of report, except to state that the babies vomited less and had more normal stools than those fed on the original Friedenthal milk, or Friedenthal's milk with washed butter fat. They continued their observations, taking into consideration the work of Osborne, Mendel, Brüning, Funk, Hess, Friedenthal, Posner, Edelstein, Csonka, and others, and had produced a milk which gave the following analysis: Protein, 1.1; sugar, 7.07; fat, 4.54; salt, 0.43.

The following points with reference to this study might be emphasized: (1) The giving of an artificial food containing fat of approximately the same qualitative characteristics as breast-milk fat meant a distinct step in advance toward the more complete adaptation of an artificial food to breast milk. (2) This change in the quality of the fat for the artificial food did not apply only to low fatty acid content of the fat, but also to many of its other characteristics. (3) The homogenizer was a machine that made it possible to suspend such fat in a food that in other respects had also been made similar to woman's milk—like Friedenthal's milk. (4) The homogenizer represented also the practical means for adding other substances of whatever nature they might be. (5) This whole scheme made the manufacture of a milk that could be given to young infants as well as to older infants without dilution probable, and this meant, especially if the product could be sold at a relatively low cost, an accomplishment of great practical importance, both to the family physician and the family as well. (6) The manufacture of the food did not represent a difficulty in keeping the bacterial content extremely low.

Dr. Coit asked Dr. Gerstenberger if he was able to tell the caloric value of this milk.

Dr. Gerstenberger replied that they had calculated the caloric value of this milk in only two proportions. With 4.5 per cent. fat the caloric content of the fat would amount to 770 calories, and with 3.5 per cent. fat the caloric value of the fat would be 670.

Dr. Hoobler, Detroit, said that in the work recently done in high fats the distinction had been made between the two kinds of fats—those from glandular tissues and those from the non-glandular. To the latter type belonged olive oil, lard, tallow, cotton-seed oil, etc. Careful observations made on animals fed on non-glandular fats showed that the animals were not sufficiently nourished by this type of fat. They might appear to be all right and might even increase in weight, but there must be a further indication of proper nourishment than increase in weight. There must be the capacity for reproduction. Animals fed on the non-glandular fats could not produce offspring. With this knowledge it was proper to inquire definitely whether food such as had been suggested would fulfill in every respect the standard that they wished to give.

HOMOGENIZED OLIVE OIL AND FAT-FREE MILK MIXTURES IN CASES OF DIFFICULT FEEDING

Dr. Maynard Ladd, Boston, said that in a paper read before the New England Pediatric Society in February, 1915, he had called attention to the possible application of the principle of homogenization of liquids of different densities to the modified-milk mixtures in infant feedings. At that time he reported results obtained by replacing cow's milk with olive oil, the emulsion being produced by the homogenizing machine invented by Gulin, of Paris. The homogenization was brought about by a powerful pump, which forced the mixture through a finely ground agate valve against great pressure. After describing the process more in detail, Dr. Ladd stated that the chemical composition of the milk was in no wise changed by the process, but in cases of milk and cream mixtures the physical condition was so changed that the fat could no longer be separated by the usual cream separators. In making the Babcock fat test more acid must be used and centrifugal action continued for a longer time. The taste of the milk was decidedly improved by this process, particularly that of pasteurized milk. As the process prevented the separation of the fat, homogenized creams could readily be pasteurized. Disturbances of emulsion brought about by rising temperature and transportation were prevented by this process. If all these things were true the process would theoretically yield a more digestible milk mixture. This milk had been used in Fariot's "Gout de Lait de Belleville" successfully and he claimed that it was taken as successfully as breast milk. When rennin was added to the homogenized milk, the curd which resulted was a homogeneous flaky paste, resembling closely the curd of human milk. The most interesting application of this principle of homogenization was in connection with the fat constituent of milk modifications, especially in so-called cases of fat intolerance. It was a question whether it was the fat *per se* which caused this interesting symptom-complex or simply the peculiar quality or reaction of some part of the fat of cow's milk. This question had led him to experiment with vegetable oils, and fats of other animals, such as lard and cod-liver oil. With the homogenizing machine they had now the opportunity of combining such oils and fats with milk or milk and other ingredients. If they could separate in a pure state and recombine into a homogeneous mixture the necessary food elements for an infant they had advanced to an interesting stage of experimentation to determine some of the possible primary causes which started up the train of symptoms leading to the digestive explosions so often seen in the artificially-fed infant. It was possible, for instance, by this method to combine an almost pure olein, or palmatin, or stearin, with fat-free skimmed milk and so eliminate almost entirely the influence of the various fats of cow's milk. They might combine a vegetable fat with precipitated casein or a fat-free lactic acid milk and test its value in acute diarrhea and other conditions in which the ordinary fats of milk were not well tolerated. Dr. Ladd related the histories of several cases in which he had tried olive oil in a fat-free lactic acid milk. In 2 other cases he had used 1.5 olive oil in a malt-soup mixture. The results justified the hope that such cases could be given a food of higher caloric value by this method, with less disturbance of nutrition and greater conservation of strength than by the methods they were now using. If they were to fairly test the application of the olive-oil malt-soup mixture they should select their cases from those that had been carefully fed in the past and failed to respond. The economic aspect of olive oil was a matter of importance, if it should be found that they could combine this with fat-free milk. Dr. Ladd reported a number of cases fed on mixtures of olive oil, maltose, protein, lime water, barley starch in percentages suited to the individual cases in which the results were very satisfactory and which warranted the hope that further investigation would confirm the promise held out by this method of modifying milk.

THE TOTAL NON-PROTEIN NITROGEN AND THE UREA OF THE BLOOD, AND THE PHENOSULPHONAPHTHALEIN EXCRETION IN INFANCY AND CHILDHOOD

Dr. Wilder Tileston, New Haven, Conn., reviewed the work of Folin and Dennis in the estimation of the non-protein nitrogen and urea in the blood and that of Roundtree and Geraghty for the estimation of kidney function by the phenosulphonaphthalein test, which he had used for a basis for his comparisons. Dr. Tileston found that the total non-protein nitrogen and urea of the blood in childhood was about one-half to two-thirds that of the adult. In this series of children the phenosulphonaphthalein excretion varied from 35 to 64 per cent. for the first hour and from 17 to 41 per cent. for the second hour. Taking the two-hour period this excretion was found to be 78 to 81 per cent. on an average. This was a higher excretion than was observed in adults, where the variation was from 50 to 80 per cent. for the two-hour period, but was frequently below 70 per cent.

In investigating the non-protein nitrogen and urea in the blood and the phenosulphonaphthalein excretion in diseased conditions, 10 cases of lobar pneumonia were observed. In 9 of these it was found that the figures were normal for the total non-protein nitrogen and urea. In the tenth case there was but a trifling increase. This was contrary to what was found in adults, in whom it was shown that about 70 per cent. of the cases gave 75 milligrams, or almost double what was found in children.

The phenosulphonaphthalein excretion varied from 17 to 85 per cent., a very wide variation, with an average of 57 per cent. The case that showed 75 per cent. was not distinctly different from the one that showed 17 per cent.; both had albumin with casts and both recovered. In scarlatina they had found no variation in the phenosulphonaphthalein excretion and an increase in the non-protein nitrogen and urea. This was in a marked case of uremia that showed 64 milligrams total non-protein nitrogen and 42 urea nitrogen, and two-thirds the total nitrogen was urea. The phenosulphonaphthalein excretion averaged 68 per cent. in 5 of these cases and the figures for the nitrogen were normal. One case of pneumonia showed a heavy albumin at the height of the disease and this case showed normal non-protein nitrogen and urea. The albuminuria was only transitory and disappeared with the crisis. To sum up, it might be said that non-protein nitrogen and urea showed a less tendency to increase in disease in childhood than in adult life. There was no doubt that a higher nitrogen percentage was an important guide as to the condition in nephritis, but in the normal individual one could allow for considerable latitude. A rising nitrogen in adults was an indication of some danger of uremia.

Dr. Morse, Boston, said that Dr. Hill had been making similar tests and had obtained the same results as those of Dr. Tileston. He found the phenosulphonaphthalein excretion higher in children than in adults; he also found that in a number of cases of nephritis the phthalein excretion was not much interfered with, hence it would seem that this test would not prove as useful in children as in adults.

Dr. Freeman, New York, said that some cases of nephritis passed as much as 90 per cent. of the phenosulphonaphthalein in two hours. One child passed only 3 per cent. in two hours and yet recovered. Such a result as that seldom occurred in an adult.

Dr. Henry Koplik, New York, said that a low degree of phthalein excretion was not inconsistent with recovery. He had made comparative tests and found that there might be a very severe nephritis and a quite good phthalein excretion (60 per cent.) in two hours. On the other hand, there might be a comparatively high excretion and the patient not recover. However, one should make this test before undertaking an operation in children. This was impressed upon him by a case in which a decapsulation was performed and the child went into uremia; if they had made the phthalein test it might have been possible to have protected the child and tided him over until he was in a better condition to withstand the operation.

Dr. Tileston, New Haven, in closing the discussion, said that the phthalein test was only of value at the time it was taken and did not necessarily indicate whether the patient would succumb or recover. He recalled one case in an adult where there was a very high nitrogen retention, even to 150 milligrams, and yet with the relief of obstruction that patient recovered.

THE VALUE OF THE X-RAY IN INTRATHORACIC LESIONS IN CHILDREN

Dr. Rowland G. Freeman, New York, stated that disappointment in the use of this means of diagnosis might result from expecting too much from it. Alone it was generally of little value, but, like other evidence, in combination with clinical history and physical signs it might be conclusive. Auscultation in determining the character of intrathoracic lesions was of materially less value than auscultation in combination with percussion, and auscultation and percussion aided by a good X-ray plate might fix a diagnosis that might otherwise remain obscure, for the X-ray would show lesions in the chest of which one could obtain no knowledge by any of the means of physical diagnosis. X-rays of the abdomen in children were frequently disappointing. Radiographs of the chest, however, in children were of material aid in diagnosis. The X-ray was probably of most value in making the diagnosis of miliary tuberculosis; often it was of value in determining a pneumonia of which one got no physical signs; in making a differential diagnosis between empyema and pneumonia; or in corroborating a diagnosis of diaphragmatic hernia, while in lesions of the heart it furnished reliable information as to enlargement, modification of the shape of the heart, in dilatation, or the presence of exudate, and it would often differentiate plastic exudate from fluid. Clear fluid gave no shadow, while pus formed a shadow. The presence of air in the chest was also well shown by the X-ray and if there occurred a combination of air and pus one got a pus level which was very characteristic. The question often arose whether a murmur heard over the heart was a so-called hemic murmur or a murmur due to a damaged valve in the heart. In such cases an X-ray picture gave one an excellent basis for an opinion as to the origin of the murmur. In diseases of the heart in children the X-ray gave a most valuable indication of the amount of damage to the heart by the size and shape of the heart shadow and successive pictures provided one of their best means for the control of exercise in these cases. For such control the temperature and pulse rate were of great value, but the X-ray picture would occasionally change their method of treatment to the advantage of the patient. Another condition well shown by the X-ray was the enlargement of the thymus gland, which gave a broad shadow above the heart. Enlargement of the bronchial and mediastinal lymph nodes might also be brought out by the X-ray. The X-ray had also given corroboration of a diagnosis of diaphragmatic hernia. In conclusion Dr. Freeman stated that the X-ray furnished most important means in reaching a definite diagnosis of intrathoracic lesions. It should not be neglected in any obscure case. It was particularly adapted to children, as one could get a better picture of a child usually than of an adult, and because children even when sick could be carried to an X-ray laboratory.

Dr. Freeman illustrated his paper by an interesting lantern-slide exhibit, showing instances where the X-ray had been of special value as a help in making the diagnosis.

Dr. Howland, Baltimore, said he could not agree that the X-ray showed the enlargement of the thymus gland. In practically all instances in which the pictures had apparently indicated an enlarged thymus and the subject had come to autopsy, death was proven to be due to some other cause. It seemed to him that the X-ray more often led one into error than it gave assistance in making a diagnosis of enlarged thymus. With reference to fluid in the pericardial angle the X-ray might also be misleading. With a certain amount of fluid in the pericardium the angle became obtuse, but when the pericardium was completely filled with fluid the angle again became acute. So that with a very large amount of fluid one might be led into error by the X-ray.

DR. KOPLIK, New York, said one should be very cautious in permitting a radiograph to make a diagnosis for him; this was especially true when there was thickened pleura and a cavity. He related an instance in which the radiologist made a diagnosis of cavity and insisted upon an operation, but physical examination showed a pneumonia of the lower lobe, and a pneumonia simulating a cavity in the upper lobe. The radiologist changed his opinion, but not in time to have avoided an operation if that procedure had depended upon him. He had one case diagnosed as thickened pleura when fluid was present. Another discrepancy was when the picture showed spots they said there was a tuberculous process in the lung, but of this they were not always certain. They needed further information based on a comparison of X-ray pictures and postmortem findings before they could rely upon the X-ray plate.

DR. CHARLES HUNTER DUNN, Boston, said he would like to agree with what Dr. Koplik had just said. They should have more comparisons between X-ray plates and postmortem findings. He had had 3 cases in which the radiologist diagnosed the presence of fluid but in which no fluid was found. So far as miliary tuberculosis was concerned they had found it repeatedly in cases in which the X-ray had not shown it. In most cases the X-ray did not show it unless there was a great deal of exudate. They had found that the X-ray did not agree with the actual findings in one-half of the cases.

DR. HOLT, New York, said they sent a case to different radiologists on successive days. The reports had come back something like this: Monday, pneumonia; Tuesday, tuberculosis; Wednesday, pneumonia, etc. In one instance in which the radiologist made a diagnosis of miliary tuberculosis with cavity in the upper lobe of the lung, it was found at autopsy that a chestnut meat had lodged in the bronchus, the blood vessels had become engorged and an emphysematous lung had been diagnosed as "tubercular lymph nodes." The X-ray was very misleading and it was a dubious procedure to base a diagnosis upon it.

Dr. Gittings, Philadelphia, said that at Phipps Institute they had been trying to diagnose alveolar tuberculosis by the X-ray; in 50 per cent. of the cases the diagnosis based on clinical findings was not corroborated by the Roentgenological examination. In 18 bodies studied lately the X-ray had failed to differentiate an enlarged thymus from enlarged bronchial lymph nodes.

Dr. Morse, Boston, said that the X-ray was a help in making a diagnosis if taken in combination with other findings, but that it was brains and not the X-ray that made the diagnosis.

Dr. Cowie, Ann Arbor, said that there were sometimes spots on the flat plate that looked like tubercles and that the flat plate could not be relied upon, but if they used the stereoscopic figure they could see the bronchi in their natural position. The X-ray was only an adjunct to be taken in combination with signs elicited by percussion, the leukocyte count, etc.

Dr. Hand, Philadelphia, said the X-ray was of great value and the more it was used the more it would be appreciated, but they did not lay stress enough on its limitations in pneumonia and empyema. It would not show how far the lesion was from the chest wall. In the diagnosis of heart conditions the X-ray was of great value. The X-ray would show whether there is any hypertrophy of the chambers of the heart.

Dr. Freeman, New York, in closing the discussion, said he was not surprised at the discussion; in fact, he had brought the slides because he felt that the value of the X-ray was not appreciated. These slides showed that there were cases in which the X-ray was indispensable in clearing up a diagnosis. Dr. Freeman said it was his own feeling that many physicians expected too much of the X-ray. As an instance, recently one of the hospital internes said to him that their X-ray man did not give him the diagnoses of the cases. Dr. Freeman had replied that if he wanted the diagnosis he should go and tell the X-ray man all he knew about the case and then the radiologist would discuss the diagnosis from his point of view. It was not the business of the radiologist to make a diagnosis. In certain instances such as have been shown by the slides the X-ray shows conclusively conditions which other signs failed to show.

TRANSPOSITION OF VISCERA IN AN INFANT

DR. ADAMS, Washington, said the baby had been attended first by his assistant and had been blue from the time of its birth. It was unconscious at times. There was a complete transposition of the viscera, about which his assistant had said nothing. He first saw the baby when it was about ten weeks old and the heart and liver were completely transposed. An examination of the heart revealed all sorts of murmurs. He told the mother the child might get better. He saw the baby in April, when it was eight months old, and it was much better; it had had no attacks of unconsciousness and blueness for some time. The examination of the heart now showed the second sound all right, but the first sound was obliterated. At the present time the baby was alive and well, but he did not think the foramen ovale would ever close.

DR. ADAMS exhibited a lantern slide that showed the transposition of the viscera.

THE COMPOSITION OF WOMAN'S MILK

DR. L. EMMETT HOLT presented the results of analyses of 35 specimens of woman's milk, 29 individual specimens and for twenty-four hours and 6 composite specimens. The results of such analyses should prove useful, since they had no standard by which to determine whether a milk was normal or pathogenic. The analyses were made for different periods, viz., the colostrum transition, mature and late periods. The results were best demonstrated by the following table:—

Periods	Cases	Fat	Sugar	Protein	Ash
Colostrum	5	2.83	7.59	2.25	.3077
Transitional	6	4.37	7.44	1.56	.2407
Mature	17	3.26	7.50	1.15	.2062
Late	7	2.96	7.45	1.02	.2080

A table was also presented showing the distribution of ash during the different periods. The ash of the colostrum period was high in sodium and potassium chlorid. The CaO was almost the same throughout the whole period. For the mature period from the end of the first month to the tenth month the close resemblance in the ratio between proteid and ash in woman's milk and cow's milk was astonishing.

The following table showed the percentage composition of ash per 100 parts of woman's and cow's milk:—

	CaO	MgO	P(2)O(5)	Na(2)O	K(2)O	Cl
Woman's	23.2	3.7	16.5	8.0	28.2	16.6
Cow's	21.8	2.9	28.9	7.2	26.5	13.0

Dr. Gerstenberger, Cleveland, asked Dr. Holt if they had made the determination for iron and if they had found that cow's milk had less iron than human milk.

Dr. Thomas S. Southworth, New York, said there was an interesting point with reference to the transitional period. This was the time when they were confronted with the bad effects of high fats in the maternal milk and got the gastrointestinal disturbances, and it was interesting to note in the tables that the fats were abnormally high at that time and then there was a tendency for them to fall; if in treating these cases they failed to overcome the difficulty by definite measures, nature came to their assistance by lowering the amount of fat.

Dr. Holt said that with reference to Dr. Gerstenberger's question, the amount of iron in woman's milk was something like 1.7 milligrams in 1,000 c.c. They had not made the analyses themselves, but had accepted the figures of Bart and Eberstein on this point.

A PLEA FOR ACCURATE STATISTICS IN INFANTS' INSTITUTIONS

Dr. Henry Dwight Chapin, New York, stated that in a report read at the last meeting of the Study and Prevention of Infant Mortality it had been correctly stated that the gravity of this problem of mortality in infant's institutions could not be correctly stated. Practically no one knew how many infants passed through these institutions each year, whence they came, or whither they went at the end of their stay. "How many die, how many of those who live, lead lives of suffering and impaired usefulness, and possibly of dependency and crime, through the action of causes that might have been prevented—these were the questions for which answers must be sought.

The problem was here very well stated, and no question of greater importance had come before a body of pediatricians for discussion and attempted settlement. The first essential was a full knowledge of all the facts, which at present were unknown. If a close coöperation could be established between physicians working in this special field and the institutions covering it, much might be accomplished in mapping out a programme that could attempt to conserve the good and do away with the evils that had grown up around this work. That the operation of these institutions left much to be desired was known to all who were engaged in the work. This was not intended to impugn motives, but the time had come to see if all this energy was expended in the wisest way, and if not, how the methods could be improved.

Statistics from the report of the New York State Department of Charities for 1909 to 1913 of eleven institutions in the State, in which the death rate for babies under two years during this period was based on the total number of children cared for, varied in the different institutions from 183 to 576 per 1,000, with an average mortality rate of 422.5 per 1,000. During this same period the death rate of children under two years of age, based on the estimated population of the State at that age, was 87 per 1,000, or about one-fifth of that in institutions. In a series of 1,738 institutional infants admitted at various ages under one year, 22.7 per cent. of all admitted died before completing the first month of residence, and 34.9 per cent. before completing the second month. Including all deaths 44.3 occurred in less than one month after admission, and 68.7 per cent. in less than two months.

In a recent article the writer reported a study of the mortality in ten infant asylums located in different cities of the United States. The time covered varied from four to twenty years, taking the shortest and longest intervals. The rates were based on the ratio between yearly admissions and deaths and were as follows: 53.17 per cent.; 40.6 per cent.; 40 per cent.; 60 per cent.; 31.7 per cent.; 75 per cent.; 68.8 per cent.; 36.1 per cent. and 49.5 per cent.

In all but one of these institutions deaths included all infants under two years. The showing would be worse if the mortality were restricted to infants under one year. Drs. Holsclaw and Rude of San Francisco, reported a mortality in the foundling asylums of that city of 50 per cent. On boarding out babies with foster mothers in order to insure undivided care, the mortality in the same class of cases had been reduced to 12 per cent. Death rates, general and special, and morbidity rates according to Woodward, must be relied upon to show where and how sanitary work must be done and to exhibit the results of sanitary work already under way. It was hence exceedingly important to have accurate knowledge of all possible data as to morbidity and deaths that might throw light upon the results of methods of operation either accomplished or under way. In order to secure such knowledge certain specific facts should be given which, in reports accessible to the writer, were rarely stated or properly analyzed. All facts that could present a fair picture of the health and hygienic condition of an institution should be carefully presented. Special care should be taken in keeping records of babies under one year. The individual study of each baby should include the history on admission, physical condition, length, weight, general nutrition, previous feedings, history and record of antecedent diseases. The babies should be classified or graded by ages on admission and physical condition, weight, length and nourishment. Summaries could then be made showing the average gain or loss under each heading. Comparisons could then be made with non-institutional babies. There should also be kept a record of the diseases acquired during the baby's stay in the institution. Summaries of individual records could then be made, showing the number of cases of each disease, of communicable diseases, mixed infections, and these diseases could be classified as to their preventability. The final summaries should show the average age on admission, the average length of stay of those who live and those who die, together with the total number of admissions and discharges. It would also be of interest to have a proper follow-up system, which could show among other data how many of those discharged before one year of age live to be a year old.

DISCUSSION

Dr. Hamill, Philadelphia, said they should thank Dr. Chapin for having brought this subject before the Society. The mortality shown by his investigations was enormously high, though they had no statistics that really showed the extent of the mortality in these institutions. Many institutions falsified their statistics. Dr. Hamill said he knew of one institution in which at a meeting of the Board it was announced that the mortality was only 10.8 per cent. He was familiar with the conditions existing in that institution and knew that frequently a physician was not called in until an infant was in a moribund condition, yet this institution was permitted to exist. The responsibility in this matter rested with the medical profession.

Dr. R. Langley Porter, San Francisco, said the striking thing in Dr. Rude's work in San Francisco was that they had a mortality of 65 per cent. among the institutional infants, but now it was less than 3 per cent., and the reason was that the children were boarded out and closely followed up. They were seen once within the week by the nurse and once within the month by a physician. Provision was also made so that a physician could be called in immediately in case of emergency. In case all the requirements for the care of the baby are not followed by the foster mother the baby is promptly taken from her. However, the women become much attached to the babies and there was little difficulty in finding suitable homes for them.

Dr. Thomas S. Southworth, New York, said statistics would be extremely valuable, but it was very difficult to get exact statistics and he was not very hopeful that they would succeed in getting such statistics as Dr. Chapin desired. Dr. Southworth said he knew of one institution which was no longer in existence in which it had been the custom to mark on every admission card "hopeless," and that covered all subsequent happenings.

Dr. Knox, Baltimore, said that in an institution caring for 200 foundlings it was found that about 90 per cent. died, and the reason the other 10 per cent. lived was because they were not continuously in the hospital but had been taken home or elsewhere for a short time. No infants lived that were kept continuously in the institution. They saw that either the institution must be improved by providing normal care for the infants or else these infants should have foster homes. They had no trouble in finding such homes in Baltimore, as many suitable people volunteered to care for these babies.

Dr. Henry L. K. Shaw, Albany, said he knew of no body of men better adapted to solve this problem than the American Pediatric Society and was very glad that Dr. Chapin had brought up this subject. He pointed out that at present institutions had no standard methods of keeping their statistics and that the statistics of different institutions were valueless for purposes of comparison. Dr. Jacobi had said that the mortality of infants in the Randall's Island Hospital was 100 per cent.; he thought they were now doing a little better than that.

It was rather strange to note that the mortality seemed to be highest in institutions under the control of religious orders. With reference to boarding the infant out, it should be remembered that there were some infants that were condemned to institutional life because of physical defects which made them so undesirable that foster mothers did not wish them. Furthermore, only babies with certain requirements could be boarded out. They should make an attempt to find the reason for this high mortality and to remedy it.

Dr. Chapin said, in closing, that the President of the Society had said last year that one of the functions of the American Pediatric Society was to deal with subjects that touched public health at large and certainly this subject must be recognized as a public health question. A great deal had been done in the reduction of infant mortality along many lines, but the thing that was doing more to keep the infant mortality high was the institutional mortality and yet these institutions were allowed to exist. As to statistics, it had been impossible to get statistical figures from foundling institutions. The Fifth Annual Meeting of the National Society for the Prevention of Infant Mortality had grappled with this problem and called attention to the difficulties surrounding it. They all knew that the mortality in these institutions was double and treble what it should be and the question was, how to prevent it.

Second Day, Tuesday, May 25, 1915

SOME STUDIES ON SUGAR IN INFANT FEEDING

Dr. Charles Hunter Dunn, Boston, and Dr. Langley Porter, San Francisco, presented a series of cases in which high percentages of different varieties of sugar had been fed and the results had been observed with special reference to the urinary findings. There seemed to be no relation between the amount ingested and the sugar in the urine. There was often more found when maltose was ingested than when lactose was given. The babies whom they had tried feeding large percentages of sugar were all those belonging to the class known as difficult feeding cases. In these they had given sugar up to 12 and 14 per cent. All gained in weight, but in some instances the gain in weight was enormous. These studies led to the conclusion that the danger of sugar intoxication had been greatly exaggerated, and that large amounts of sugar could be given with advantage in certain difficult feeding cases, especially those showing an inability to take a large amount of fat. There was but little danger from such a procedure since the signs of sugar indigestion were easily recognized and could be quickly averted by lowering the amount of sugar, while the benefits of pushing sugar beyond the limits usually considered safe were great.

Dr. Schloss, New York, said he had been making tests by the copper and bismuth methods and indeed by every known method to determine the reduction substances in the urine and sugar was present usually as a monosaccharide.

Dr. Holt, New York, said that if by giving large amounts of sugar the child gained rapidly for a few days and then a break came this gain was rapidly lost and the question was, "What had the child really gained?" The greatest difficulty was in children with intolerance to carbohydrates, as it was difficult to make them gain in weight, since one could use sugar only in small quantities. In reference to the sugar content of *eiweissmilch,* if it was made according to the formula it contained only one-half as much sugar as did buttermilk. When the curds were washed through the sieve both the sugar and salts are reduced in quantity. The reduction in the sugar was probably the reason the children did not gain on protein milk, and the idea that it was because the salts were not furnished did not hold.

Dr. Koplik, New York, said that the amount of sugar that was given should be limited to normal quantities. If large amounts were given the child gained for a time, then stood still and then lost, so that it should only be given within proper limitations.

Dr. Gerstenberger, Cleveland, asked if the protein content of the food fed these children was also high. If there was a high protein content that would permit of a higher percentage of sugar, while a low protein content would limit the amount of sugar that could be taken.

Dr. Sherman, Buffalo, said he would like to refer to a few tests that they had made in Buffalo as to the effects of the different sugars on the gastric secretion. Sixteen babies were fed of 6 per cent. dextro-maltose, cane and milk sugars, dissolved in barley water so as to give bulk. The babies took all the solutions well. They concluded that cane sugar stimulated the secretions more than milk sugar; that dextro-maltose stimulated the secretions twice as much as milk sugar. It was important to remember this in feeding infants with hypersensitive stomachs. It seemed that milk sugar stimulated the motor function of the stomach more than the other sugars.

Dr. Griffith, Philadelphia, said they had been using malt soup mixtures and buttermilk and cane sugar, and these had a high carbohydrate percentage. They found that the children took from 10 to 13 per cent. of carbohydrates well. It was not a question of temporary gain but they had had better results with this method than with any other.

Dr. Dunn, in closing the discussion, said that in his series of cases the gain in weight was retained. These babies had a high tolerance for sugar and they cut the sugar down as soon as any intolerance developed. Whether the children went to pieces depended not only on the length of time they were kept on the high percentage of sugar but also upon whether high percentage of fats was also fed. Fat intolerance might be caused by an excess of sugar or protein fermentation. The amount of protein in the food made a great difference in the sugar tolerance. They had made observations along this line in some of the earlier babies of the series by varying the amount of protein. In judging of the effects of the sugar content of the food, it should be noted that some sugar contained gas spores and other impurities, causing effects which might lead one to draw wrong conclusions. The sugar must be carefully boiled to avoid such errors. Finkelstein was now using higher percentages of sugar than formerly.

THE INDICATIONS FOR TREATMENT IN SEVERE DIARRHEA IN INFANCY

Dr. John Howland and Dr. W. McKim Marriott, Baltimore, considered a type of diarrhea which all recognized as particularly serious in infants. It was especially likely to occur in those infants who, as a result of diarrhea, were more or less malnourished. After perhaps a few days of mild diarrhea the stools became large, watery and frequent. The infants were at first restless and sleepless; later it was frequent for stupor to develop, and oftentimes coma. The urine was very scanty and extremely acid, frequently containing albumin and casts, and sometimes sugar. Respiratory symptoms were very often present, especially toward the close of the disease. These might consist in a slightly increased ventilation of the lungs or the disturbance might be so great as to amount to severe dyspnea. There was, however, no cyanosis. Post-mortem, the lesions were insignificant. This type of diarrhea had been called "Toxicose," by Czerny and "alimentäre Intoxikation" by Finkelstein. During the past summer, many determinations had been made with reference to the alimentary air. In infants who had severe diarrhea, especially if dyspnea was present, the carbon dioxide tension was found to be very much lower than in health, and the more severe the dyspnea the lower the carbon dioxide tension. It was found also that as improvement took place, the tension rose. As low carbon dioxide tension was one of the evidences of an acidosis, other evidence of this had been sought. The blood serum had been examined by the phenolphthalein test of Sellards and it had been found that in infants with severe diarrhea, a change could be noticed varying from slight diminution in the color to complete absence of color. The hydrogen-ion concentration of the serum had also been investigated and had been found to be increased. The urine of these infants had been found very scanty and strongly acid. These infants had a very marked tolerance for alkalies, whether given by the mouth, intravenously or subcutaneously; three, four, or even five times as much alkali had been required to cause an alkaline urine as in health. There was also evidence afforded by the influence of the alkali when given, intravenously and subcutaneously. When the alkali had been taken in sufficient amount it had brought about a normal hydrogen in concentration of the blood, had caused the Sellards test to give a deep purple with phenolphthalein, had stopped dyspnea, and had caused a return of the carbon dioxide tension of the alveolar air to normal, or even abnormally high limits. An examination of the urine for acetone bodies had usually been without result. In view of these findings it seemed perfectly fair to say that these patients suffered from acidosis and from a very severe acidosis. The acidosis was probably a relative one, caused by the loss of alkali from the intestines. It seemed therefore bad practice to give cathartics which would irritate an intestine already too irritated and cause a loss of material from the bowel which it was vitally necessary for the infant to retain. Unless an infant was distended, cathartics were contraindicated; opium was to be given in amount only sufficient to diminish the excessive diarrhea.

It was also necessary to give soda by mouth, by rectum intravenously or subcutaneously. The intravenous was the method of choice, if a vein was accessible. It should be given in large enough doses to cause a cessation of the dyspnea and alkalin urine. This method of treatment improved the likelihood of recovery but did not mean that recovery would inevitably ensue. The severe acidosis might be combated and yet death might take place. In closing, Dr. Howland said that this condition should not be termed "food intoxication"; it was not due to the presence of abnormal substances, but to the absence of substances that were very normal and necessary to life.

DISCUSSION

Dr. Gerstenberg, Cleveland, asked Dr. Howland what dosage of alkali he gave by mouth and intravenously.

Dr. Koplik, New York, said that he had always taught that opium was a very dangerous drug and that it was very difficult to gauge the dose in severe cases of diarrhea in infants and children. He did not see why one should stop the diarrhea and the peristalsis which was the means by which nature eliminated a noxious substance which would otherwise be absorbed into the circulation and increase the difficulties. Years and years of clinical work with babies had taught him that it was best to treat them without opium of any kind.

Dr. Kerley, New York, said that opium was one of the best drugs they had if it was used in the right way. Drainage must be maintained but not to the point of exhausting the patient. Opium was indicated in moderate doses sufficient to control the diarrhea.

Dr. Abt, Chicago, said he would like to hear what Dr. Howland's opinion was with regard to feeding in these cases. The feeding was more important than the giving of alkalies. What did he do in the way of feeding to prevent acidosis?

Dr. Blackader, Montreal, said one could do almost anything with opium. By giving small doses one could give the digestive fluids a chance to act and favor absorption. Large doses of cathartics exaggerated the diarrhea and hurried the intestinal contents on through the digestive tract and the large bowel, while opium in doses sufficient to control the extreme peristalsis did a great amount of good in these cases. Dr. Koplik's statement should not go out from this meeting without some modification.

Dr. Morse, Boston, said that it seemed to him that the question as to whether opium was indicated in diarrhea or not depended on the circumstances in the individual case. If there was something in the bowel and one wanted it out then a cathartic was indicated. If, on the other hand, the diarrhea was simply draining the tissues then opium should be given. The cases to which Dr. Howland referred belonged to the second class, and opium should be given. Another point that came up was whether in such a disturbance of the digestion there was any absorption from the bowel, and whether toxins would be absorbed even if they were present in the intestines. There was something else also to be drawn from this paper and that was that it was advisable to give alkalies before the appearance of severe symptoms.

Dr. Talbot, Boston, said that in studying diseased conditions it was important to know the normal ones, and he had recently been studying physiological acidosis. It was necessary to know about acidosis in normal conditions in order to make comparisons in pathological ones. In studying 100 newborn babies he found the respiratory quotient very low on the second and third day of life. Such a low respiratory quotient was found in acidosis in diabetes when there were no acetone bodies in the urine. This substantiated Dr. Howland's findings of a low carbon dioxide tension in the alveolar air before acetone bodies appeared in the urine.

Dr. Howland, Baltimore, in closing the discussion, said he disliked the term acidosis because it was so loosely applied. A small amount of acetone bodies did not mean acidosis; it was only when the protective mechanism was brought into play that a pathological acidosis was produced. If a child had a disturbance accompanied by high fever and the intestines were filled with fermentative and putrefactive substances then opium should not be employed, but if there was nothing in the intestinal tract and the diarrhea was a protective process carried to the extreme and accompanied by the excretion of a large amount of alkali which was causing the symptoms, then opium should be given, not sufficient to cause the child to go into coma, but in small quantities, a few drops after each loose stool. It was surprising how much opium these children could take without it influencing their stupor in the slightest degree. All drugs were dangerous, and when one was given for a serious condition it had to be in sufficient quantity to produce the effect. He gave four grams of alkali at a time subcutaneously, five or six grams intravenously, and three or four grams by the mouth at one time. The diet was extremely difficult to manage. The majority of these children died, but with intelligent treatment it was possible to save more than if the indications for treatment were disregarded.

THE ETIOLOGICAL RELATIONSHIP OF SYPHILIS TO CHOREA OF SYDENHAM

Dr. Henry Koplik, New York, stated that the investigations into the etiology of Sydenham's chorea had been devoid of any special results. There was clinically an undoubted connection between chorea and endocarditis, and between chorea and rheumatic joint manifestations. Of late there had been an effort to connect chorea in an etiological way with syphilis. On the appearance of salvarsan this remedy had naturally been tried. Arsenic had for decades been a favorite remedy in chorea. What with pushing this drug to the point of toleration by the mouth could be more natural than to apply it in another form—injection into the circulation? Bokai thought it was of great benefit in the treatment of chorea, especially in cutting short the duration of the affection. From this to the surmise that there was a connection between chorea and syphilis was but a step. After reviewing the reports of the various investigators who seemed to have observed this association, Dr. Koplik said he had endeavored to enlighten himself as to the relationship between chorea and syphilis. He took 10 successive cases of chorea in his hospital service at the Mount Sinai Hospital. In 5 of these cases there was an endocarditis on admission to the hospital, with an evident lesion of the valves; in 3 cases there was a distinct history of rheumatism; in 10 cases a Wassermann test was made, and in 8 the result was satisfactorily negative. In 2 the reaction failed, but was not positive. In all the cases there was absolutely no stigmata of syphilis, hereditary or otherwise. There was no reason why, had a sufficiently large number of cases been subjected to the Wassermann test, they might not have met cases in which syphilis was present. For a child affected with syphilis might contract chorea just as readily as another. The presence of syphilis might be an accidental find. The attempt of the French writers to accept a luetic basis for chorea, on the ground that the salvarsan treatment was of special effect in chorea was also to the essayist not convincing. For the benefit of the service and of these choreic children, Dr. Koplik determined to test the action of salvarsan in chorea minor. Nine cases were injected with doses of varying size. In 7 of the cases thus injected no striking amelioration of the symptoms such as had been reported was observed. Even after a second and third injection the chorea continued to run its accustomed course. In another case nephritis resulted and the patient was ill with the chorea for some weeks, although finally a recovery took place. The administration of salvarsan, requiring a certain amount of apparatus, was not exactly applicable as a therapeutic measure in chorea. Nor could the drug be said to exert such a striking improvement as to encourage a continuance of its use; neither did it prevent a relapse. In fact, there was nothing in the after affects to warrant an assumption of a possible syphilitic or parasyphilitic influence, as a causative factor in the chorea of Sydenham. In the opinion of the essayist they had not in salvarsan an agent of any value above what had hitherto been in vogue in the treatment of chorea minor, nor were they warranted in tracing any relationship between chorea and hereditary or acquired syphilis.

Dr. Hoobler, Detroit, observed that streptococcus viridans had been found in the blood of four patients suffering from chorea at Bellevue Hospital, and that this organism had also been found in a number of instances by English observers.

Dr. Saunders, St. Louis, called attention to a sign which he made use of in the diagnosis of chorea. This was dependent on the fact that during the first septima of life when asked to open the mouth, a child also separated the fingers. If the child had chorea he did not do this. He kept a child with chorea in bed and out of school until the association of these two movements again appeared.

Dr. Abt, Chicago, said he wished to say a word with reference to the arsenic treatment of chorea. He had adhered to the use of arsenic in chorea for some years but noticed that some children became ill with neuritis after taking arsenic. He had now abandoned the arsenic and relied upon the rest treatment, and where there was rheumatism on the salicylates.

Dr. Koplik, New York, said he had mentioned in the first part of his paper that Cohn and Sachs had found micro-organisms in the blood of choreic patients and that Dr. La Fétra had isolated the streptococcus viridans in several cases in Bellevue Hospital. He had taken the cultures of probably as many as two dozen cases and was very much annoyed that others had found organisms that he could not find. Arsenic was one of his favorite remedies, since it was very useful in the tonic treatment of chorea, but he felt uncertain as to its usefulness in the disease itself.

THE REDUCING SUBSTANCE IN SPINAL FLUID

Dr. Oscar M. Schloss and Dr. Louis C. Schroeder, New York, made this report, which was read by Dr. Schroeder and which was based on a series of quantitative determinations of the reducing substance in spinal fluid and on certain observations concerning the nature of the reducing agent. In order to obtain additional evidence on this subject three specimens of cerebrospinal fluid, from 400 c.c. to 600 c.c. each, were precipitated with alcohol and evaporated to small bulk in slightly acid solution. This concentrated solution was dextro-rotatory and a comparison of the quantity of dextrose calculated on this basis with a determination by Benedict's quantitative copper solution were in close accord. The solution fermented readily with yeast and gave a typical osazone, insoluble in hot water, soluble in pyridine and melting at 200 to 210° C. A repetition of this procedure of Halliburton gave no precipitate of pyrocatechin. As further proof other observations were made. By using a slight modification of the method of Benedict and Lewis for blood sugar they had been able to make accurate determinations with only 5 c.c. or even less of spinal fluid. The results of their examinations in 26 cases were tabulated and admitted the following summary: The reducing substance in spinal fluid was a fermentable, dextro-rotatory sugar, probably dextrose. In infants free from meningeal disease the spinal fluid sugar ranged from 0.05 to 0.134 per cent., approximately the same figures which were obtained for blood sugar. In cases of meningism the spinal fluid sugar was normal. In epidemic cerebrospinal meningitis and suppurative forms of meningitis the sugar was greatly reduced or absent. A large proportion of the cases of tuberculous meningitis showed a decrease in the sugar of the spinal fluid. In a number of cases, the sugar was normal or diminished but slightly. A decrease of sugar only was of diagnostic value in this disease. The reducing substance was not decreased in cases of idiocy, cerebrospinal syphilis or anterior-poliomyelitis.

Dr. Hand, Philadelphia, said he had examined a number of specimens of spinal fluids and had felt that the reduction substance present was a sugar, though he had not gone as far with his observations as Dr. Schloss. He had been struck by the fact that there was something absent in suppurative meningitis that was present in tuberculous meningitis and he had been so much impressed by this difference that he had used it for diagnostic purposes. The presence of sugar in the spinal fluid of cases of meningitis had stimulated him to search for the tubercle bacilli.

Dr. Schloss, New York, said with reference to the prognosis in cerebrospinal meningitis, that if there was a reappearance of sugar in the spinal fluid that was one of the best indications of improvement. He had noticed in a small series of cases of cerebrospinal meningitis that at the first examination there would be no reduction substance and no sugar or only a small amount, but after the injection of the serum there would be a perceptible rise in the sugar and this would be accompanied by a marked clinical improvement. As to the reducing substance in the serum, the quantity was so insignificant that he doubted if it would have much influence.

ACUTE CEREBELLAR ATAXIA IN CHILDREN

Dr. J. P. Crozer Griffith, Philadelphia, reported this case, which occurred in a female child five years of age. The noteworthy features were the rapid development of symptoms without discoverable cause, unless possibly the child had suffered from influenza; the very uncommon degree of nystagmus, the ataxia of the extremities; disturbance of the sensorium; affection of speech; slight increase of reflexes, and the rapid recovery, completed within one month from the onset. These symptoms pointed chiefly to some disorder of the cerebellum, but that this was the only portion of the brain affected would seem questionable. It was impossible to draw a sharp line between the cerebellar and the cerebral cases. After reviewing the classification of Fickler, Dr. Griffith stated that according to this classification the encephalitic cases followed especially the infectious diseases. The toxic cases would be represented in early life by those depending upon gastro-intestinal autointoxication. Clinically it would be difficult to make a sharp distinction and in connection with this case the two might be grouped under the heading of acute non-suppurative encephalitis, or acute hemorrhagic encephalitis. The prognosis of the great majority of cases of acute non-suppurative encephalitis, whatever the location, was favorable as far as life was concerned, and as regarded improvement, but less so regarding complete recovery of power and of a normal mental condition. After reviewing 17 cases collected from the literature and analyzing them, the essayist concluded that as an immediately apparent cause of the attacks infectious diseases were very evident. The complex symptoms based on the composite of all the cases seems sufficient to warrant a belief in the cerebellar origin. Disturbances of the sensorium were present in the early stages of a large number of cases. Unconsciousness was mentioned in 11 instances. Convulsions were occasionally seen; delirium was also observed. All of these might be classed among the symptoms common to any intracranial lesion; or they might be the evidence of a complicating disturbance in other regions than the cerebellum. Some affection of mentality apart from unconsciousness was present in 12 cases. In most of them it was of brief duration. The disturbance of speech sometimes lasted for months. It was possible that in producing the speech disturbance the medulla was also involved, and the same was true of vomiting. It was evident that there was a distinct tendency to increase of the reflexes in this disorder, pointing toward the cerebellar involvement. The series showed how frequently there might be a cerebellar ataxia without nystagmus. In 7 of the cases it was stated that entire recovery took place. There was every reason to believe that in some instances very few if any evidences of the disease would remain. However, that severe symptoms might persist for a long time and probable always was shown by at least 8 of the cases and in some of these some intellectual or psychic abnormality remained.

FOREIGN BODY PNEUMONIAS

Dr. August Caillé, New York, reported 3 cases which he had observed at the Post-Graduate Hospital during 1914. Two of the cases were seen in the ward, an outside diagnosis of unresolved pneumonia having been made without any suspicion of a foreign body in the lungs. The third case had a foreign body history. In the first case the spasmodic character of the cough, the expectoration of pus in an acute condition and amphoric breathing aroused suspicion of the presence of a foreign body. The X-ray showed a large tack in the right lung, which their bronchoscopist succeeded in removing at a second attempt. Rapid recovery followed. The second case gave a history of unresolved pneumonia and spasmodic cough lasting a year. No pus was found on puncture but the X-ray showed a large nail in the left bronchus and partly in the trachea. Following the removal of the nail by a lower tracheotomy, an extensive pneumonia developed and the child died. In the third case a history of having swallowed a large brass shawl pin was given. The pin had been in the child's lungs forty-three days without causing inflammation. These cases served to teach that all cases of unresolved pneumonia and cases of pneumonia of a typical behavior should be X-rayed. Such cases should be reported in the lay press so that they would serve as a warning to those having the care of young children not to teach by example the bad practice of putting things in the mouth.

DISCUSSION

Dr. Graham, Philadelphia, said that Dr. Caillé's paper called attention to facts that had only come to their notice during the last two or three years, and that was the possibility of a foreign body gaining access to portions of the lung. He had three cases that fell into the same category as those of Dr. Caillé in that the possibility of the presence of a foreign body had not been suspected. It was well to have the attention of the profession called to this possibility.

Dr. Miller, Atlantic City, related the case of a boy who was admitted to the ward with a spasmodic cough, fever, coarse râles and all the signs of lobar pneumonia on the right side. After three or four days the boy coughed up a tack and there was a rapid disappearance of his symptoms.

Dr. Koplik, New York, related two instances somewhat similar to those already cited, and said that if the X-ray did not reveal the presence of a foreign body where one was suspected of being present it was wise to make an examination with the bronchoscope.

MENINGITIS IN THE NEWBORN, WITH REPORT OF A CASE

Dr. Charles Herrman, New York, presented this report. The writer in a search of the literature had found only eight instances of meningitis in the newborn, which were confirmed by postmortem and bacteriologic examination. After reviewing these cases, Dr. Herrman said that in the present instance the baby was normal when the mother took him from the Lebanon Hospital, where he was born, in November, 1914. The day after leaving the hospital this baby was admitted to Dr. Herrman's service in a cyanotic, limp and apathetic condition. There were absolutely no symptoms suggesting the possibility of meningitis. The temperature became sub-normal, the child more cyanotic, breathing more irregular and death ensued on the following day. The examination made by the coroner's physician, Dr. Riegalman, showed, on opening the skull, thick yellowish green exudate covering the anterior surface of the brain. It was not uniformly distributed and there was an increased amount of fluid in the ventricles. The exudate appeared to extend to the cord. The thymus was small. Microscopic examination of a section of the brain covered by the pyogenic membrane showed that the parenchyma was infiltrated with numerous round cells and the vessels were injected. The lungs were congested and many air vesicles were filled with bood and endothelial cells. Culture from the meningeal exudate showed the pneumococcus. The case was interesting because it was the only case of pneumococcus meningitis in the newborn which had been reported. Infection might have taken place through the placental circulation, by premature respiration, through a birth injury to the skull, or after birth. The B. Coli was the most common causative agent in the cases reported in the literature.

Dr. Sedgwick, Minneapolis, said that meningitis in the newborn was more frequent than had been indicated. The reason it had not been more frequently recognized was because in a maternity hospital the baby was a secondary consideration. This was only one of the occurrences that served to emphasize the necessity of providing proper pediatric care for infants. The ideal arrangement would be to have a pediatric department in connection with the maternity hospitals. Schauter's Clinic was the only one that he knew of where this was done. If they had this opportunity to study the newborn he felt sure they would learn many interesting things.

Dr. Koplik, New York, said he had seen several cases of meningitis in the newborn. He had seen one in which the child on the sixth day had a pyelitis, due to colon bacilli and a colon meningitis; this child lived eight months but developed hydrocephalus. So far as he could remember, the cases that he had seen in the newborn were due to the streptococcus. In one infant, six weeks of age, the meningitis seemed to be due to a bacillus somewhat similar to that of typhoid. Many of these cases were not diagnosed or were diagnosed as sepsis.

Dr. La Fétra said he wished to emphasize what Dr. Koplik and Dr. Sedgwick had said, namely, that these cases were much more common than they had been led to believe. Dr. La Fétra had read a paper before the New Jersey Pediatric Society in which he had reported a number of cases of meningitis in the newborn which had come under his observation at Bellevue Hospital. He had seen another recently which he had not reported. In these cases the symptoms of meningitis were not prominent; the symptoms were rather those of sepsis. Sepsis was not accompanied by a high temperature, but, on the contrary, the temperature was low, not over 99½° or 100° F. Another symptom of meningitis in the newborn was the marked cyanosis and the fontanel was not distended. Hence the symptoms of meningitis might be taken for those of general sepsis in these cases. Sometimes the colon bacillus was the infecting agent and they had also found a bacillus resembling the typhoid bacillus. In cases in which there was a marked cyanosis a lumbar puncture might be advisable, not on account of the meningitis, but on account of the possibility of hemorrhage which might be amenable to treatment.

Dr. Herrman, New York, said that he believed, as Dr. Koplik said, that meningitis in the newborn occurred more frequently than he had mentioned and that there were many cases that were never reported. As to the control of the newborn, the pediatrists should have the care of newborn infants and they might then study methods for the prevention of infant mortality to greater advantage, but the obstetricians did not wish to give up what they had. All the cases of meningitis in the newborn that he had reported were under the age of three weeks; if he had included those up to three months the number would have been greater.

A CASE OF AMAUROTIC FAMILY IDIOCY IN ONE OF TWINS

Dr. Charles Herrman, New York, reported this case. He stated that the patient was twenty months old when first seen and presented the typical symptoms of amaurotic family idiocy. Some years ago Hirsch held that the changes in the central nervous system in these cases were caused by toxic substances which were present in the mother's milk. These infants received the mother's milk only two weeks and it was difficult to see why it was toxic for one child and not for the other. It was now recognized that amaurotic family idiocy was a typical example of an abiotic family disease. About 100 cases had thus far been reported; many more had not been recognized or reported. The writer had 11 cases under observation during the past sixteen years. The essayist discussed the etiology of the condition and stated his reasons for believing that the disease was not any more common in the children of Russian emigrants than among others. The large number of patients among the children of Hebrew parentage could best be explained by the rôle played by consanguinity, and the mode of transmission could be explained on the basis of the Mendelian principles of heredity. The unit characters in the ancestry which were involved in amaurotic family idiocy were evidently of the recessive type.

DISCUSSION

Dr. Koplik, New York, stated that in a case in which amaurotic family idiocy was suspected examination of the fundus of the eye by the ophthalmoscope enabled one to make the diagnosis instantaneously.

Dr. Herrman, New York, said that early in the child's life it was not so easy to make the diagnosis by the eye condition. At that time the eye changes were not so distinct. The disease was congenital and not acquired, but although the condition was inherited in some instances the child appeared to be normal for five months and then began to show symptoms. Hirsch later gave up the idea that the mother's milk had anything to do with the production of the condition. It was difficult to explain this case on a toxic theory since the two children had the same nourishment and the same environment and one developed the disease while the other remained normal.

GENERAL TUBERCULOSIS INCLUDING THE SKIN IN A CHILD

Dr. William P. Northrup, New York, reported this case, which occurred in a baby, weighing nine pounds at birth. The infant was breast-fed. At the age of four months the child was taken with diarrhea and wasting. It had a cough but no vomiting and no crying. The skin eruption and the X-ray enabled him to make the diagnosis of miliary tuberculosis. This was the fourth case of the kind that had come under his observation. The other 3 he had reported. These cases suggested the following deductions: In a case of suspected miliary tuberculosis, a good X-ray, next to an autopsy, gave the most intimate knowledge of the lesion in a child's lungs. The eruption in miliary tuberculosis furnished a pathognomonic sign for diagnosis. A valuable and almost conclusive point for prognosis was that the skin lesion was almost always an indication that one was dealing with a fatal form of tuberculosis in young children. The histology varied with the acuteness of the invasion. In cases of acute tuberculosis the vesicles (necroses) were the first revealed lesion. Bacilli were found frequently in the blood and in the eruption. The lesion was probably always embolic. The characteristics of the individual lesions were that they were the size of the rose spot in typhoid fever, were tipped by a tiny vesicle, surrounded sooner or later with a congested hemorrhagic zone followed by the formation of a crust, which, when removed, left a pit. Experience with this eruption was like that with scurvy in infancy, when once seen, the lesion could not be again overlooked.

MACEWEN'S SIGN. AN ANALYSIS OF THE ANATOMICAL CONDITIONS WHICH ENTER INTO THE PRODUCTION OF THIS SIGN AND THE VALUE OF ITS PRESENCE IN DIAGNOSTICATING CHANGES IN INTRACRANIAL PRESSURE

Dr. Herbert B. Wilcox, New York, presented this paper, which was based on observations made in Dr. La Fétra's service at Bellevue Hospital. Macewen's sign was best determined by placing the stethoscope on the forehead just above the base of the nose. The skull was then tapped with the percussing finger or the hammer, over the parietal region, beginning just over the parietal boss from which the percussing finger should approach to the point at which the stethoscope was applied. This should be carried out on both sides of the head. A typical sign observed in this way consisted in a high-pitched, sharp, short, cracked-pot note. It was most distinct when percussion was being done over, behind, or below the parietal boss on either side, was unchanged as the point percussed passed downward, and diminished in intensity and character as the point percussed approached the stethoscope. The latter point was important in differentiating between a false and a true Macewen's sign, as the reverse obtained in percussing a normal skull.

The writer concluded as follows:

1. The skulls of children of various ages and development have percussion notes peculiar to the state of the cranium. 2. It is possible to establish a note normal to the various types of crania found in infants and children. 3. A positive Macewen's sign exists when variation from the normal note was found. It consisted in a relative change rather than a definite condition common to all diseased crania. 4. The sign was better elicited by the stethoscope than by the unaided ear. 5. Increased clearness of sound when percussion was done over the posterior portion of the skull rather than near the stethoscope was diagnostic. 6. The sign uniformly accompanied conditions of increased intracranial tension and was not found unless this causative factor existed. 7. It is equally applicable to infants and to older children. 8. It was present in

50 of 53 cases of tuberculous meningitis. 9. It was present in 17 of 18 cases of meningitis of other types. 10. It was found to vary directly with the development and recession of cerebral symptoms as complications of disease not directly affecting the central nervous system. 12. It was present in 11 of 15 cases of pneumonia, in 5 of which lumbar puncture showed increased cerebrospinal fluid under pressure. 13. The sign was uniformly lacking in children normal as to the brain and its coverings.

DISCUSSION

Dr. La Fétra, New York, said he wished to congratulate Dr. Wilcox on the persistence with which he had worked on this sign which for many years he had thought was of no value. It required very careful attention to the points which Dr. Wilcox had brought out in order to distinguish between the true and the false signs. These points Dr. La Fétra reiterated, and in closing said he hoped Dr. Wilcox would continue his investigations, as this sign might be important in giving an indication as to when one should draw off spinal fluid in cases other than meningitis.

Dr. Koplik, New York, said he had used Macewen's method and found it useful in beginning tuberculous meningitis and in serous meningitis due to otitis. Much depended on the ability of the individual to apply this method. He had found it presented the greatest difficulty in children who had rachitis and a little hydrocephalus and as they grew older developed cerebral disease. The older the child the more valuable was the sign.

A PRELIMINARY REPORT ON THE PNEUMONIAS IN CHILDREN, WITH SPECIAL REFERENCE TO ITS EPIDEMIOLOGY

Dr. Godfrey R. Pisek, New York, discussed the findings in 1,000 cases of pneumonia in children studied in the wards of the Post Graduate Hospital. A series of charts were presented showing the mortality and the results of plate culture of the sputum. After reviewing the work of Dr. Cole and that of Dr. Gillespie on the varieties of pneumococcus, and discussing the epidemiology, Dr. Pisek summarized as follows: From a study of 1,000 cases a mortality of 43.3 per cent. was established. This was probably higher than was obtained in private practice among well-to-do people, but was the average for the mass of city dwellers. Broncho-pneumonia was pre-eminently a disease of the first two years of life, and after the third year was relatively uncommon. Lobar pneumonia was the type of the disease which was present after the third year in practically all cases of pneumonia, if those cases which were frequently secondary to some other condition or those in which the pneumonia occurred as a terminal condition were omitted. Lobar pneumonia *per se* was a common condition in the first and second years of life, being much more frequent than was commonly supposed. The infection which was the etiologic factor in lobar pneumonia was always the pneumococcus, while a broncho-pneumonia might be due to a number of organisms, such as the streptococcus or the influenza bacilli, occurring alone or as a mixed infection. If pneumococci were present in broncho-pneumonia they were usually one of a group of organisms commonly found in the mouth. The pneumococci might be divided into four general groups, each being made up of many races which were closely related. By the method outlined a pure culture of pneumococcus might be obtained and the group determination completed within twenty-four hours from any given case of pneumonia. The division of the pneumococci into groups was of great importance from the standpoint of treatment, since a serum or vaccine prepared from organisms of one group could not be applied in the treatment of a pneumonia due to organisms of another group. It was hoped that the division of pneumonia into groups would eventually bring about the treatment by means of specific sera or vaccines, thus replacing the symptomatic treatment of to-day. A careful scrutiny of this series of cases failed to reveal any evidence of an epidemic, or even of a house infection.

Dr. Graham, Philadelphia, said that Dr. Pisek had stated that 41 cases of lobar pneumonia out of the 1,000 developed empyema. His experience was that the percentage of empyemas varied from year to year. The mortality of 63 per cent. for empyema in lobar pneumonia which Dr. Pisek had found was certainly different from his experience, but it made a great difference whether the pneumonia occurred in hospital or private patients.

Dr. Sedgwick, Minneapolis, brought out the point that the mortality from pneumonia was quite different in different parts of the country. In Minneapolis Dr. Barrett reported a series of 125 cases of lobar pneumonia without death. He had 36 cases with only one death and that occurred in an old man who had complications. In Minneapolis the mortality of pneumonia in infants and young children was almost *nil.*

Dr. Blackader, Montreal, said that a high mortality in pneumonia was not their experience in Montreal.

Dr. Pisek said that Dr. Graham's remarks were borne out by the statement made in the paper that the critical cases were sent to the hospital. When a patient at the fifth, sixth or seventh day was doing badly he was sent to the hospital. The empyema cases that succumbed were usually under eighteen months. Much depended on the activity of the surgeon. Conservative surgery gave a young child a better chance of survival. The children in the outlying district who were in a better environment stood the disease better than those in the city living under less favorable conditions.

AN UNUSUAL CASE OF CONGENITAL HEART DISEASE, WITH DEMONSTRATION OF SPECIMEN

Dr. John Lovett Morse, of Boston, said that the child from whom this specimen was taken was born January 1, 1906, and weighed only three pounds. There was a definite history of cyanosis since the child was four months old. When the child was four years of age the lips and nails were blue and there was general cyanosis when he cried, and some bulging of the precordium.

There was no distinct murmur, though one physician who examined the child said he heard a slight murmur. In November, 1914, the child became ill. The blood picture showed 120 to 140 per cent. hemoglobin, 11,000,000 to 12,000,000 red blood corpuscles, 8,000 to 12,000 white blood cells, 82 per cent. mononuclears and 68 per cent. polymorphonuclears. The child had high fever and vomiting, but no thrill and no definite murmur. Dr. Howland saw the child at this time and said he heard a slight murmur. The child then developed a diastolic murmur and later a systolic murmur. The temperature became elevated, liver enlarged, and blood pressure 120 in systole and 50 in diastole. The child died suddenly of embolism. They did not make a distinct diagnosis but said "endocarditis implanted on congenital heart disease." In brief, the heart had two ventricles and two auricles and an opening between the upper part of the ventricles in the membranous portion, a transposition of the great vessels, with atresia and some malformation. There were three patent valves. Dr. Morse said he had been told that there were only five cases like this one on record.

DISCUSSION ON DR. MORSE'S PAPER

Dr. Northrup, New York, said he had reported a similar case before the New York Pathological Society some years ago.

Dr. Howland, Baltimore, said he had seen the child from whom the specimen was taken in life and the murmur was very mild. It was interesting to find a diastolic murmur in a congenital condition; since in congenital heart conditions the murmur was usually systolic or continuous. The child probably had an acute endocarditis engrafted on the congenital malformation. He had seen one or two children with diastolic murmurs and always wondered what the lesion of the heart might be. Dr. Howland related the history of a case which came to autopsy in which the right ventricle was practically only a conus arteriosus and the left ventricle was entirely below the right and was very small. In this case there was only a systolic murmur.

REPORT OF A CASE OF MYELOGENOUS LEUKEMIA IN AN INFANT NINE MONTHS OLD

Dr. J. Mason Knox, Baltimore, reported this case. The history of the child was negative until two weeks before her admission to the hospital. Severe symptoms came on five days before her admission, suddenly and without prodromata. They consisted in nausea, vomiting, diarrhea, described as fecal fluid, mucous but with no blood, some fever and a cough that had persisted for two weeks. The physical examination was unimportant for the most part. The condition of the child remained about the same for ten days and then became decidedly more serious and progressively worse. The symptoms pointed to gastrointestinal intoxication with unusual gastric irritability. The report of the blood examination showed a moderate secondary anemia. There were 200,000 leukocytes and the differential count showed the presence of a large number of myelocytes from the bone marrow.

The platelets were about normal and there was no fragility of the cells. The polymorphonuclears were young, often with scanty granulations and showing all transitions to myelocytes. The lymphocytes were mostly of the typical small variety. The picture resembled chronic myeloid leukemia except for the predominance of atypical granulations in most of the myelocytes and in the high percentage of small leukocytes, probably due to the age of the patient. In this case the atypical granulations seen in the neutrophilic myelocytes and the presence of eosinophiles and basophilic varieties was good evidence of primary disease of the blood-forming agents.

DR. BLACKADER, Montreal, related the history of a case somewhat similar to the one reported by Dr. Knox. This child had a very slight rise in temperature, respirations 34, pulse 130, and the blood examinations showed a very rapid change in the blood picture. He was puzzled to know whether the case was similar to that of Dr. Knox or whether it was a case of food intoxication.

DR. KNOX said the lesson to be drawn from these cases was that in cases of persistent nausea and vomiting the blood should be examined early in the course of the disease.

THE HYDROGEN-ION CONCENTRATION OF THE GASTRIC AND DUODENAL CONTENTS IN CHILDHOOD

DR. JULIUS PARKER SEDGWICK, Minneapolis, presented this study. He said that until recently they had been satisfied with the determination of the acidity of the body fluids by the trituration method. This method was unsatisfactory, since it determined only acids plus salts of weak bases in a solution. It was not a measure of the degree of acidity or alkalinity of that solution. The writer reviewed the work of various investigators with reference to hydrogen ionization and described the methods commonly used for determining the hydrogen-ion concentration of fluids, namely, the "gas chain" method which was the more accurate, and the indicator method. The former was the one best adapted for research work because of its greater accuracy. The duodenal contents were obtained by the Hess catheterization method. A summary of the work warranted the following conclusions: 1. The results of other observers which showed a low acidity of the gastric contents of infants during the height of digestion were confirmed. 2. The sharp rise of acidity of the gastric contents of infants towards the close of digestion was shown. 3. The gastric contents of a newborn infant before food was taken were very acid. 4. The duodenal contents of infants obtained by the Hess method were not alkaline, but showed hydrogen-ion concentrations of from 79.5 to 0.9 times 10—5.

DR. GERSTENBERG, Cleveland, asked Dr. Sedgwick what he had fed the infants. Were they artificially fed or breast fed?

DR. SEDGWICK replied that one was artificially fed and the others were breast fed.

DR. GERSTENBERG asked if there a was decided difference between the artificially-fed and the breast-fed infants in hydrogen-ionic concentration of the gastric and duodenal contents.

DR. SEDGWICK replied that there was not a great difference.

Third Day, Wednesday, May 26, 1915

BUSINESS MEETING — REPORT OF COUNCIL
OFFICERS FOR ENSUING YEAR

President, Dr. Rowland G. Freeman, New York City; Vice-President, Dr. J. C. Gittings, Philadelphia; Secretary, Dr. Samuel S. Adams, Washington, D. C.; Treasurer, Dr. Charles Hunter Dunn, Boston, Mass.; Editor and Recorder, Dr. L. E. La Fétra, New York City.

REPORT OF COMMITTEE ON CHILD LABOR PROBLEM

DR. PHILIP VAN INGEN, New York, presented this report. He first told of the difficulties that beset the investigator along these lines, since so little material was available in the way of statistics that could be relied upon. They had endeavored to collect data with respect to the various kinds of labor in which children were employed and to ascertain to what extent they were employed. They could only report progress. The question of the various occupations that children were engaged in brought up medical questions upon which they had no data. So they had begun an investigation of the subject of fatigue and its results, mental and physical, upon the development of the child and upon the mature organism. They had studied occupations with reference to mortality, to susceptibility to certain diseases and the effects in this connection of race and heredity. Direct evidence of the effects of different occupations on the children engaged in them practically did not exist. They had collected a good deal of material but would have to go a long way to get at the facts.

REPORT OF THE COMMITTEE TO CO-OPERATE WITH THE FEDERAL BUREAU

Dr. Hamill reported that the Federal Bureau had consulted them in a number of instances and that the Committee had given this Bureau advice on certain subjects upon which they wished to have medical opinion.

SOME INTERESTING FACTS PLAINLY BROUGHT OUT BY A CHART METHOD OF STUDYING AND MANAGING CASES OF DIABETES MELLITUS IN CHILDREN

Dr. T. DeWitt H. Sherman, Buffalo, made this presentation, in which he emphasized the importance of charts in furnishing an easy and quick way of giving information concerning a case. The upper half of the charts presented showed in unbroken lines the number of grams of the three food elements ingested and their total caloric value. The lower half showed in broken lines the urine analyses and the condition of the patient on the selected diet. The use of colored chalks brought out other information, as, for instance, the number of grams of carbohydrate ingested and its relation to the amount of sugar in the urine. By the use of this method of charting a case the writer had been led, in one case which was given as an illustration, to the conclusion that sugar in the urine was caused first, by feeding high fats, and second, by mental anxiety. In another case it was shown that fish caused sugar, while all the other proteids were fairly well tolerated. In still another case it was shown that high fats caused cyclic vomiting. Sugar might appear before cyclic vomiting more often than they suspected.

DIFFERENTIAL DIAGNOSIS OF STENOSIS AND SPASM OF THE PYLORUS

Dr. Alfred Hand, Philadelphia, read this paper, in which he stated that there were no more difficult problems in diagnosis than those pertaining to the abdomen in infancy and early childhood. The greater activity of the digestive functions at this age was likely to cause disturbances which closely resembled some one or more of the organic affections. There was a tendency to use the term spasm of the pylorus for gastric indigestion, which was due generally to improper feeding. Still one did meet with cases in which it seemed that the vomiting did not depend entirely on gastric indigestion, but that the tonic condition of the pylorus was also present, allowing little if any of the stomach contents to pass into the duodenum. The first case of this kind came under his care after he had witnessed a pyloroplasty after which the infant succumbed within twenty-four hours, in whom the history was very suggestive of pyloric stenosis, but on examination he was unable to demonstrate a lump anywhere in the abdomen, and he could never satisfy himself that peristalsis was visible. Influenced by the fact that the infant was only two months of age and that an enema sometimes brought away fecal matter he determined to try dietetic care for a while longer. Progress was very slow, but in the second year nutrition finally became very satisfactory. It was difficult to classify this case. During its progress the writer was of the opinion that it was a case of pyloric hypertrophy with a sufficient degree of patulousness to allow of slow general development, and either the body grew up to the hypertrophy or it actually disappeared, if that was ever the case. The question also arose as to whether it was a pure case of pylorospasm, or one of gastric indigestion with spasm, the indigestion being gradually overcome by the dietetic measures, and the spasm ceasing with the removal of the exciting cause. Following this case 5 others were seen; in 4 of these peristalsis was visible, and in one a skiagraph showed a complete retention of bismuth in the stomach until it was vomited. A tumor could not be felt in any of them. The results in these 6 cases, which lacked only the palpable tumor to establish the diagnosis of congenital hypertrophy of the pylorus. had made the essayist incline to the belief that the genuine condition itself was amenable to dietetic treatment. Dr. Hand also related the history of a case in which the conservative course of treatment failed to produce any progress; after three weeks in which there was no gain a posterior gastroenterostomy was performed by Dr. Deaver and the patient made a prompt and gratifying recovery. Hence he felt that the diagnosis of hypertrophic stenosis was established and operation indicated. But in the absence of a mass, even if there was visible peristalsis and projectile vomiting and failure of the bismuth to pass the pylorus during an X-ray examination, it was advisable to persist in dietetic treatment with further observation of the patient. Even if one could only keep the weight stationary the patient was growing older steadily, with a possible increase in the chances for surviving an operation, should it be deemed necessary later.

DR. HARRY DEAVER, Philadelphia, spoke of the surgical side of the subject of pyloric stenosis in children. He stated that the number of cases of pyloric stenosis that were being reported was increasing. The condition was interesting because of the obscurity of its etiology, the difficulty of recognizing the cases and the diversity of opinion as to the treatment. The symptoms were projectile vomiting, constipation, visible peristalsis and steady loss in weight. The vomitus showed no bile. The urinary output was diminished. If there was a tumor and the peristaltic wave was seen moving from left to right every minute or two, one could not be mistaken in the diagnosis. When this condition was present the child usually succumbed in from four to six weeks. A number of theories had been advanced to account for this condition. The X-ray was sometimes a great help in diagnosing it. Where operation was necessary gastroenterostomy was the operation of choice. When all the typical symptoms were present and one could follow the tumor and the X-ray confirmed the diagnosis an early operation was indicated, and it had been his experience that children stood operation well, and when operated upon early all recovered. Out of 6 cases he had 2 deaths and both of those were in infants greatly emaciated. One never felt a palpable mass in a case of pylorospasm. If the child cried when an attempt was made to palpate a tumor he never hesitated to give a whiff of ether. The operation in an infant was a very delicate one because the walls of the jejunum were very thin. The jejunum should be joined to the stomach without any loop as close as possible.

DR. HERRMAN, New York, said that the point had been made that the presence of a palpable mass was indication for an operation, but many cases in which a mass was palpable got well without an operation. As to pure pylorospasm, these cases had never been proven to be pure spasm without any change in the pylorus.

Projectile vomiting was not a characteristic upon which one could base a definite diagnosis. Pylorospasm and stenosis were not two distinct conditions, but they were different degrees of the same condition. The prognosis depended on the degree of stenosis. Dr. Herrman said he had two patients for whom he had advised operation. This was refused, and the children recovered without any operative interference. As to the operation the favored method at present was to simply divide the obstruction without going into the stomach and to sew at right angles.

Dr. Coit, Newark, said he wished to sound a note of warning against a too great readiness to submit these children to operation. He related at length the case of an infant whose symptoms were indicative of pyloric stenosis and such a diagnosis was confirmed by the X-ray, yet under careful medical treatment the child recovered.

Dr. Graham, Philadelphia, said the question of diagnosis rested on the gravity of the symptoms. There seemed to be so much confusion as to the indications for operation that it seemed best to be guided by the severity of the symptoms.

Dr. Deaver, in closing, emphasized the fact that the presence of a palpable tumor was an indication for operation.

Enuresis—A study by A. B. Schwartz (Boston Medical and Surgical Journal., 1914, Vol. CLXXI., p. 631) of 226 cases of enuresis, 148 males, 98 females, 3 diurnal, 134 nocturnal, and 89 both diurnal and nocturnal, leads to the conclusion that the cause of enuresis in children is not the same in every instance. In some the nervous element undoubtedly plays a part, and in others faulty habits. Local irritation from any source is a predisposing cause. Excessive fluids result in greater secretion of urine, while too little fluid results in a concentrated urine, which, whether it contains crystals or not, may irritate the base of the bladder and cause the desire for frequent micturition. Enlarged tonsils and adenoids apparently have no connection with enuresis. Digestive disturbances did not in themselves have any connection with the condition, but it is conceivable that constipation may be a predisposing factor.—*The American Journal of Obstetrics.*

DEPARTMENT OF ABSTRACTS

Original Condensations of Current Pediatric Literature by the Editors and the Following Associates

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Edwin T. Wyman.......Boston, Mass.
J. Herbert Young.......Newton, Mass.

Wood, Nathaniel K.: Percussion of the Lungs. An Effort to Standardize the Degrees of Dullness. (Medical Press and Circular, December 23, 1914, p. 644.)

The author comments on the difficulty of making accurate comparison regarding percussions, and that the standard of clinicians for the various degrees of dullness, 1-2-3-4 line dullness, meaning respectively impaired resonance, definite dullness, very marked dullness and flatness, are almost impossible for the ordinary student to grasp. On making a study of the pitch of the various notes of percussion, the author finds a variation of two octaves between normal resonance and flatness. He has plotted on the piano the notes corresponding to his personal standard for the different degrees of dullness. On this presumption he advocates a musical standard for the accurate demonstration to students of the various notes heard on percussion.

S. McL.

Spiller, William G.: Severe Jaundice in the Newborn Child a Cause of Spastic Cerebral Diplegia. (The American Journal of the Medical Sciences, March, 1915, p. 345.)

Four cases are reported by the author in which severe jaundice had a direct etiological relation to cerebral diplegia. Intracranial hemorrhage may be produced by some abnormal condition of the blood which may cause hemophilic jaundice and thereby lead to arrest of the brain development. A review of the literature on the subject follows with the author's 4 cases in detail.

H. R. M.

Howitt, H. O.: The Subcutaneous Injection of Oxygen. (Medical Press and Circular, December 23, 1914, p. 646.)

The author enthusiastically advocates the use of oxygen subcutaneously, comparing it to the formation of an artificial lung. The oxygen is generated from sodium peroxide coming in contact with water in a closed cylinder, the escaping gas is connected up with a rubber tube and aspirating needle, and enough oxygen is used to raise a wheal twice the size of a fist. He mentions the use of its employment in pertussis, emphysema, pneumonia, operative shock, etc. He cites several cases in detail in which it was employed. S. McL.

BOOK REVIEW

A Manual of the Diseases of Infants and Children. By John Ruhräh, M.D., Professor of Diseases of Children in the College of Physicians and Surgeons, Baltimore, Md. Illustrated. Fourth edition, thoroughly revised. Philadelphia and London: W. B. Saunders Company, 1914.

Printed first in 1905, this little book has gone through various revisions and reprintings until now it again appears in its modern, up to the minute guise to help primarily the student of medicine and secondarily the busy practitioner. As the author states in his preface it is a fact that the average third or fourth year medical student has approximately fifteen or so subjects to study and to correlate. It is with this in mind that Dr. Ruhräh takes pity on the long suffering student and provides for him a short and concise *vade mecum* so that he can grasp the more essential facts without wading through the accumulated mass of the larger text-book of reference. In this volume numerous minor changes and additions have been made, among others an article on pellagra, the use of the soy bean, addenda to the section on infant feeding, a chapter on drug eruptions and a full account of the Binet-Simon mentality test for children. In particular there might be mentioned a sample pamphlet of information for distribution among the poor in summer; a section on how to look up pediatric literature; and a very complete index. The book is well written and well bound.

ARCHIVES OF PEDIATRICS

JUNE, 1915

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ORIGINAL COMMUNICATIONS

BOSTON AS A PEDIATRIC CENTER

BY JOHN LOVETT MORSE, A.M., M.D.

Professor of Pediatrics, Harvard Medical School; Visiting Physician at the Children's Hospital; Consulting Physician at the Infants' Hospital and the Floating Hospital, Boston

Whatever claims Boston may have to being a pediatric center are based on the activities of the Department of Pediatrics of the Harvard Medical School, which numbers among its members most of the live pediatricians of Boston and through them is able to utilize the greater part of the clinical material in Boston for teaching purposes. The Pediatric Department of the Harvard Medical School is made up of young and active men, all of whom are actuated by a common purpose, to do just as good work as they can, to teach as well as they know how and to make Boston the center for pediatric teaching of the United States. They are willing to sacrifice themselves and their practice in the future, as they have done in the past, for the good of the school and the department and for the advancement of the teaching of pediatrics in Boston. Everyone in the department is anxious to do all that he can to give every graduate and undergraduate just what he is looking for and needs.

The Harvard Medical School occupies a unique position in this country in that it teaches its own methods of infant feeding and its own classification and treatment of the diseases of the digestive tract, instead of copying those of others. It believes and teaches that all routine methods of feeding are irrational and that the food for each baby should be prepared for that baby according to the indications at the given time. That is, it stands for individualization, not routinism, in infant feeding. It believes in the same way that there can be no routine treatment for the disturbances of digestion in infancy and that bacteria play a large part in the etiology of diseases of the digestive tract. In fact, the Harvard Medical School is a definite school of pediatrics, not simply a place where pediatrics is taught.

In accordance with an arrangement between Harvard University and the managers of the Children's Hospital, the Infants' Hospital and the Boston Dispensary, Harvard University nominates the visiting physicians to the Children's and Infants' Hospitals and to the Department of Diseases of Children at the Boston Dispensary. The Department of Pediatrics of the Graduate School of Medicine of Harvard University controls, therefore, the clinical material in these institutions. By an arrangement with the head of the Contagious Department of the Boston City Hospital and with the physicians in charge of the Children's Department of the Massachusetts General Hospital, the Floating Hospital and the Milk and Baby Hygiene Association, the clinical material of these institutions is also available for graduate teaching.

There are at present 19 men connected with the Department of Pediatrics of the Harvard Medical School. Eight of these are located at the Children's Hospital, 2 at the Infants' Hospital, 3 at the City Hospital, 4 at the Massachusetts General Hospital and 2 at the Boston Dispensary. The staff of the Floating Hospital is made up from these men and many of them are connected with the Milk and Baby Hygiene Association. The department is also able to utilize as teachers the physicians connected with the Department of Nervous Diseases of the Children's Hospital and to arrange for courses in the various laboratory branches with other departments of the school.

The Children's Hospital has 40 medical beds and 80 devoted to surgery and orthopedic surgery. There were 592 cases treated in the medical wards in 1914. The number will be larger this year, because the new building was not occupied until last April. There were 2,597 new patients treated in the Medical Out-Patient Department in 1914 and the number of visits made by the old and new patients together was 11,213. The number of new patients treated in the various departments of the Out-Patient Department was 6,776 and the number of visits made, 36,188.

The Infants' Hospital has 65 medical beds. At present only a little over 30 of them are in use, because of lack of funds. It is probable, however, that next autumn the hospital will be run at its full capacity. Three hundred and three infants, suffering from 73 different diseases, were admitted to the hospital from March 3, 1914, when it was opened, to January 1, 1915. The building was designed by the late Dr. Rotch to be as perfect as possible an institution for the care of children under two years of age, and to be a model building for teaching purposes. It contains a model milk laboratory for the preparation of modified milk and especial facilities are provided for instruction in practical milk modification. Exceptional opportunities are afforded for the study of the pathology of infancy, because of the fact that postmortem examinations are made in practically every fatal case. There is also a directory for wet nurses connected with the hospital, where physicians can obtain wet nurses or breast milk for their patients. The women and their babies are all examined and a Wassermann test made in each case. No woman is sent out as a wet nurse unless she is perfectly healthy.

The Children's Department of the Massachusetts General Hospital has 7 medical beds in the winter and 17 in the summer; 211 patients were treated in the wards in 1914; 2,157 new patients were treated in the Out-Patient Department, and 11,798 visits made by old patients. Especial attention is now being paid to the treatment of acute and chronic diseases of the heart in the Out-Patient Department in connection with social workers. The department also has the medical care of all the babies in the other departments of the hospital and the medical charge of the children and babies at the Massachusetts Charitable Eye and Ear Infirmary, a service of about 40 beds. Especial opportunities are afforded at the Massachusetts General Hospital for the study of metabolism in infancy as the result of an arrangement with the Nutrition Laboratory of the Carnegie Institution of Washington.

The Boston Dispensary has 25 medical beds for children; 288 patients were treated in the wards in 1914, 3,000 new patients were treated in the Children's Out-Patient Department in 1914, and 14,705 visits made by the old and new patients together. This institution is now making a special point of the boarding out of babies and of the supervision of children that are placed in private homes.

The contagious wards of the City Hospital have accommodations for 340 patients: 2,967 patients were treated there in 1914; 1,488 had diphtheria, 1,208 scarlet fever and 228 measles; 13 cases of whooping-cough, 7 of German measles and 30 of chicken-pox were also treated.

The Floating Hospital is in commission from July 1st to about the middle of September. It has wards for the continued treatment of sick babies and in addition takes babies out for the day on the out-patient deck; 342 babies received 6,516 days' treatment in the wards and 565 babies 4,002 days' treatment as out-patients during the season of 1914. All the food for these babies is prepared in the milk laboratory on the boat. The boat carries an expert bacteriologist and an expert chemist, and especial attention is being devoted to the bacteriology and metabolism of the acute diarrheal diseases of infancy. This institution affords an unequalled opportunity for the study of these diseases.

The Milk and Baby Hygiene Association now has 12 milk stations which not only distribute milk but are centers for the dissemination of knowledge regarding the proper care and rational feeding of infants. It maintains 14 visiting nurses. It had 4,097 babies in its charge in 1914.

Much attention is being devoted at all the hospitals to the problems of social service and each hospital has its own department. They are all similar but differ somewhat in the special problems which they undertake to solve and in the details of their routine work. An admirable opportunity is afforded by them for the study of social service.

The Department of Pediatrics of the Harvard Medical School is, as already stated, not only willing, but anxious, to meet the needs of everyone who wishes to study pediatrics. It has arranged a variety of courses during the winter, some of them coming but once a week and designed for physicians living nearby, others occupying all day, every day, for physicians coming from a distance, who wish to do intensive work for a short time. It is also prepared to give instruction for short periods or for portions of a day, once a week, or several days a week, according to the desires of the applicants. It is able, in connection with the Department of Chemistry, to arrange courses for physicians who wish to study the metabolism of infancy and childhood and to undertake original investigations in these subjects. A number of physicians have taken advantage of this opportunity during the past year. It is also in a position to arrange comprehensive courses for physicians who wish to devote a number of months consecutively to the study of pediatrics and closely allied subjects.

An arrangement which has proved itself satisfactory for physicians who have had no special training in pediatrics is to have them attend in a general way the exercises arranged for the fourth year course in pediatrics. The general arrangement of this course is as follows:—

The mornings, except as detailed below, are spent in the Out-Patient Department of one of the hospitals. A lecture, either clinical or didactic, is given each morning by one of the instructors. Practical work in the modification of milk is given one morning each week at the Infants' Hospital. An hour is devoted one day each week to practical work in the diseases of the ear in infancy and childhood. One or two mornings each month are spent at the Burroughs Place Dispensary in the study of tuberculosis in childhood.

Monday afternoon is spent at the Children's Hospital. The first hour is occupied by the examination of cases; the second hour by a quiz and clinical lecture on selected cases. Tuesday afternoon is spent at the Infants' Hospital, and Thursday afternoon at the Contagious Department of the City Hospital. Wednesday and Saturday afternoons are devoted to the study of the nervous diseases of childhood in the Out-Patient Department for Nervous Diseases at the Children's Hospital. The first two Friday afternoons of the month are given up to instruction in the examination of the stools, urine and cerebrospinal fluid in infancy and childhood. On the third Friday afternoon there is a visit to the Walker-Gordon farm, in Charles River Village, and on the fourth there is a visit to the Walker-Gordon laboratory.

When physicians have taken this preliminary course, or when they have had special training in pediatrics elsewhere, they are given more advanced work from the beginning. A plan which has worked very well recently is to have the physicians spend the morning at one of the hospitals, making the visits in the wards with the physicians and spending the rest of the time in the Out-Patient Department. The afternoons are then devoted to special clinics, either in pediatrics or in diseases of the nervous system in children, the surgery of children, orthopedics, or diseases of the nose and throat in children. In the courses given at the Infants' Hospital and in the Out-Patient Departments of the other hospitals ample opportunity is afforded to observe and master the methods of infant feeding taught in the Harvard Medical School, and their application in diseases of the digestive tract.

A combined course is being arranged for next winter in which the instruction will all be given at the Children's Hospital. In this course, pediatrics, orthopedics, the surgery of children, diseases of the nervous system in children and diseases of the nose and throat in children will be covered by the various departments of the hospital. It should prove most valuable for those who wish to get a comprehensive survey of disease in early life.

The arrangement of the instruction is somewhat different during the four summer months. A course is planned for each month to occupy all day every day for the month, the object being to cover the field of pediatrics as far as is possible in the given time. The courses given in the different months are similar, but differ somewhat in detail and in the personnel of the instructors. Although arranged by months, these courses may be entered at any time and taken for as long or as short a time as the physician desires. Any division or divisions of the course may also be taken separately, if desired. The following schedule for next July is representative of the other months also.

An opportunity is also provided for physicians who have taken other courses, and shown themselves capable, to act as graduate assistants in the out-patient departments for a nominal fee. In these positions they are compelled to think and act for themselves and to take responsibility. Being under competent supervision, they learn far more than when they are simply talked to or at and do nothing for themselves.

JULY

HOURS	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
9-10.30	Dr. Dunn I. H. Wards 287 *B*	Dr. Dunn I. H. Wards 287 *B*	Dr. Dunn I. H. Wards 287 *B*	Dr. Dunn I. H. Wards 287 *B*	Dr. Dunn I. H. Wards 287 *B*	Dr. Dunn I. H. Wards 287 *B*
11-12.30	Dr. Talbot M.G.H., W'ds and O.P.D. 288 *B*	Dr. Howard B.D., Wards and O.P.D. 284 *B*	Dr. Talbot M.G.H., W'ds and O.P.D. 288 *B*	Dr. Howard B.D., Wards and O.P.D. 284 *B*	Dr. Talbot M.G.H., W'ds and O.P.D. 288 *B*	Dr. Howard B.D., Wards and O.P.D. 284 *B*
1.30-3	Dr. Ladd C. H. Wards 304 *B*	Dr. Ladd C. H. Wards 304 *B*	Dr. Ladd C. H. Wards 304 *B*	Dr. Ladd C. H. Wards 304 *B*	Dr. Ladd C. H. Wards 304 *B*	Dr. Ladd C. H. Wards 304 *B*
3.30-5.30	Dr. Place So. Depart. B.C.H. 290 *B*	Dr. Percy C. H. Lab. 310 *B*		Dr. Place So. Depart. B.C.H. 290 *B*	Dr. Percy C. H. Lab. 310 *B*	
4-6			Dr. Thomas C. H., O.P.D. 291 *B*			Dr. Thomas C. H., O.P.D. 291 *B*

B.C.H., S. D.—Boston City Hospital, South Department, 745 Massachusetts Ave., Boston.
B. D.—Boston Dispensary, corner of Bennet and Ash Sts., Boston.
C. H.—Children's Hospital, Longwood Ave., Boston.
F. H.—Floating Hospital, pier at North End Park, Commercial St., Boston.
I. H.—Infants' Hospital (Rotch Memorial), Vandyke St., Boston.
M. G. H.—Massachusetts General Hospital, Blossom St., Boston.
O. P. D.—Out-Patient Department.

There are a number of positions as house officers in the various hospitals open to graduates. There is no better way for a man who wishes to make a specialty of pediatrics to get a comprehensive grasp of the subject than by serving as house officer in one or more of the Boston hospitals. A man who has taken the service at the Children's Hospital, the Infants' Hospital and the Floating Hospital, as a number of men have done and are now doing, has a working knowledge of pediatrics which cannot be obtained by taking years of courses. The term of service at the Children's Hospital is nine months; at the Infants' Hospital, three months; at the Massachusetts General Hospital, six months;

at the Boston Dispensary, six months; and on the Floating Hospital, three months. Beginning this autumn a combined competitive examination will be held for all of these positions at the same time.

The Department of Pediatrics of the Harvard Medical School is prepared to aid in every way those who wish to undertake special investigations in the realm of pediatrics and to place the facilities of its clinics at their disposal. Its close association with the Department of Chemistry in the Harvard Medical School and the Nutrition Laboratory of the Carnegie Institution offers unusual opportunities for investigation in these fields. A number of physicians have taken advantage of them during the past winter.

The fact that 146 physicians have taken 160 courses during the past two years shows that the opportunities for graduate study in pediatrics in Boston and at the Harvard Medical School are beginning to be appreciated. These physicians came from all parts of the United States and Canada, 38 states and provinces being represented, while one came from China. The Department of Pediatrics of the Harvard Medical School hopes and expects that the number will be doubled and quadrupled during the next two years. It feels that, because of the abundance of clinical material at its command and the considerable number of instructors connected with it, it will be able to meet the demand, however great it may be.

TREATMENT OF WHOOPING-COUGH—In view of the insignificance of the local lesions compared to the hyperexcitability of the nerves of the region attacked by whooping-cough, sedative treatment should be adopted. Finding that veronal allays the vomiting of sea-sickness, Wassermann tried the drug in other affections in which vomiting occurs, and obtained remarkable results in the case of whooping-cough, the actual disease being influenced. As euquinin has an antispasmodic action in this disease, he gave veronal combined with euquinin in powdered chocolate. The doses adopted were: For a child of about two years, one-tenth of the adult dose of veronal, and double or treble this amount of euquinin. Infants begin with a dose of 0.039 g. (gr. ss.) of veronal. Bromural may be given in place of veronal, or the two may be given alternately.—*Therap. Monats.*, October, 1913.

HOMOGENIZED OLIVE OIL AND FAT-FREE MILK MIXTURES IN CASE OF DIFFICULT FEEDING*†

BY MAYNARD LADD, M.D.

Instructor in Pediatrics, Harvard Medical School

In a paper read before the New England Pediatric Society in February, 1915, I called attention to the possible application of the principle of homogenization of liquids of different densities to modified milk mixtures in infant feedings. At that time I reported some results obtained by replacing the fat of cows' milk with olive oil, the emulsion being produced by the homogenizing machine invented by M. Gaulin of Paris, the American patent of which is controlled by the Manton-Gaulin Mfg. Co. of Boston. Since then I have had an opportunity to carry out some clinical experiments in additional cases, the results of which, although the babies are still under observation, are the subject of this paper.

As the principle of the homogenizing machine is unfamiliar to many and has been applied to milk modifications in this country to a very limited extent, a few words of explanation may be in order.

Homogenization of liquids of different densities consists in reducing the constituent elements into such a physical condition that they will no longer separate, but will maintain a permanent and even composition throughout the mixture.

Briefly stated, this result is brought about by a powerful pump which forces the mixture through a finely ground agate valve against great pressure. After its passage, the mixture is perfectly homogeneous, and in the case of milk, or mixtures of milk and oils, the fat globules are crushed, torn and pulverized, and so incorporated with the other elements of the milk, that they can no longer rise by action of gravity, separate after long standing nor agglutinate.

M. Gaulin's first machine was brought out in 1899. With this, the fluid elements were forced through very fine capillary tubes, but the practical results were not perfect, owing to the fact that many of the fat globules passed through the smallest possible capillary tubes without alteration. M. Lindet, of l'Institut

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* Read before the Twenty-seventh Annual Meeting of the American Pediatric Society, Lakewood, N. J., May 25, 1915.

† From the medical service of the Children's Hospital.

Agronomique, who had interested himself in M. Gaulin's invention, demonstrated that the ascending force of fat globules were proportionate to the cube of their radii, and that the principle of stabilization of milk consisted in reducing these radii to a dimension as near as possible to zero. The diameter of butter fat globules varies from 1/100 to 1/1000 of a millimeter, whereas the smallest hole that can be bored in a metallic surface is about 1/10 of a millimeter. This led M. Gaulin to adopt an entirely new method of carrying out his original idea, and in 1902, he announced his invention of a device which subjected the fat globules to great pressure between two surfaces, exactly adjusted to each other, but sufficiently elastic to permit the passage of the most minutely divided particles.

The essential patent in this homogenizing machine is an agate valve, so finely ground that it will leak only under great pressure, and held in its bed by a variable tension spring, which is regulated by a fly-wheel with a screw end. The mixture is pumped against a pressure which may vary up to 500 kilos. The pumps vary in capacity from 50 to 2,000 litres per hour; according to the size.

The chemical composition of the milk is in no wise affected by the process, but in cases of milk and cream mixtures, the physical condition is so changed that the fat can no longer be separated by the usual cream separators. In making the Babcock fat test, more acids must be used and centrifugal action continued for a longer time.

Homogenization improves decidedly the taste of the milk or cream, particularly that of pasteurized milk. As the process prevents the separation of the fat, homogenized creams can be readily pasteurized. When commercial milk is to be transported long distances in warm weather, and its temperature allowed to rise from lack of proper refrigeration, the continual jolting to which it is subjected causes the cream to be churned into butter fat, and it is impossible to reincorporate it into the milk in its original form. The same disturbance of emulsion may, under similar conditions, happen to milk modifications. We are all familiar with the greasy surface seen in summer in the bottles of milk brought to the clinic by the mothers who live at a distance, so that a considerable quantity of fat is often taken into the baby's stomach in large indigestible globules.

The application of homogenization to ordinary whole milk or to any kind of a milk modification, will overcome this defect, and theoretically it would seem as if it would yield a much more digestible mixture. This is one of the points I hope we shall be able to determine in the series of cases I have planned.

Variot, in Paris, has used a homogenized milk in the "Goutte de lait" de Belleville. He claims it is taken as successfully as breast milk and has never seen cases of infantile scorbutus nor rachitis which could be attributed to its use. Chevalier demonstrated by chemical analysis that the constituents of homogenized milk are more completely absorbed than those of simple sterilized milk. The more finely divided the food, the greater is its accessibility to the digestive fluids, and the greater its assimilation.

It is interesting to note also that when rennin is added to homogenized milk, the curd which results is a homogeneous flaky paste, resembling closely the curd of human milk.

Last October, while discussing various feeding problems with Mr. F. W. Howe of the Walker-Gordon Company, I first learned of this invention of M. Gaulin. The idea of utilizing it to improve the quality of ordinary milk modifications occurred to us at that time, and it required very little imagination to foresee a possible field for investigation into infant foods which may open many new lines of study. Through the kindness of Mr. Walker, and the coöperation of Mr. Howe, we were able to secure temporarily for experimental purposes one of the homogenizing machines and install it in the laboratory where it could be run by the power plant of the refrigerating apparatus.

The most interesting application of this principle of homogenization is in connection with the fat constituent of milk modifications, especially in cases of so-called "fat intolerance." One recognizes a class of feeding cases in which the fat of cow's milk, if given in too large percentages, leads to a digestive crisis of a serious nature. The restoration of the infant's tolerance for fat then becomes a very slow and gradual process. During this period the nutrition suffers severely. There are, of course, all degrees of intolerance. The milder cases may generally be corrected and controlled by careful feeding. The severe cases often resist our best efforts and pursue an interrupted downward course. Certain of these babies are capable of digesting high percentages of carbohydrates and proteins, so that the nutrition of the body can be maintained, but others are unfavorably affected by such an unbalanced ration. Without recourse to breast-milk, many of them cannot be made to thrive.

The fact that the great majority of cases of fat intolerance occur in artificially fed infants, and the further observation that in the first year at least they generally respond favorably to breast-milk, raises the interesting question as to whether it is fat *per se* which causes the familiar symptom-complex or simply the peculiar qualities or reaction to some part of the fats of cow's milk. Generally speaking, breast-milk contains a much higher percentage of fat than that which has been given in the milk formula and yet under its use the symptoms gradually disappear, and metabolism is restored to its normal basis.

These considerations have led to more or less experimentation with vegetable oils and fats of other animals, such as lard, and with cod liver oil. But we have now an opportunity to combine such fats and oils with milk or milk and other ingredients in a practically perfect and permanent emulsion, so that we may reasonably expect a more efficient result from their use, not only for infants, but invalids.

If, as a matter of experiment, one can show that olive oil, for instance, is readily digested and assimilated when homogenized with skim-milk, in these cases of intolerance to cow's milk fat, one can then seek by more detailed experiments, of a more exact and scientific method, to find out what element or elements of cow's milk fat is the source of the toxic substances which seem to be formed in the processes of digestion.

One of the most striking facts which recent metabolism experiments in infants has shown is the interrelation of the various ingredients of milk in normal metabolism. A disturbance in the digestion of an element frequently influences the metabolism of the other elements, and the end result which we see in the vomiting, diarrhea, abnormal stools, malnutrition and toxemia, represents a very complex series of antecedent causes.

Now, if we can separate in a pure state and recombine into a homogeneous mixture the necessary food elements for an infant, we have advanced to an interesting stage of experimentation to determine some of the possible primary causes which start up the train of symptoms leading to the digestive explosions so often seen in the artificially fed infants.

It is possible, for instance, by this process of homogenization to combine an almost pure olein, or palmitin, or stearin with fat-free skim milk and so eliminate almost entirely the influence of the various fats of cow's milk. By using a chemically pure precipitated casein, we can combine pure casein with pure oils and pure sugars of different varieties, adding artificially prepared mineral matter in varying proportions. Such mixtures, homogenized, may be found to be of use in exact metabolism experiments, although they would be too expensive and complicated for practical feeding.

We may combine a vegetable fat, such as olive oil, with precipitated casein, or fat-free lactic acid milk, and test its food value in acute diarrheas, or in convalescence from acute diarrheas, conditions in which the ordinary fats of milk are not well tolerated. I have had an opportunity so far to test the tolerance to olive oil in these acute infections in 3 cases only; one a convalescent from a severe infectious diarrhea, and 2 during an infectious diarrhea at the end of the first week of fever. In the convalescent case, the child, two and a half years of age, took 2 per cent. of olive oil in a fat-free lactic acid mixture and gained over a pound in four days. The case returned then to the country and I was not able to observe further its use.

In the other 2 cases, the 1.50 per cent. of olive oil was given in a malt soup mixture. Both children, one one year, the other three years of age, have steadily improved. As the cases are far away from Boston and the parents have no means of weighing the children, my observation of the effect of the food is incomplete, but the result at least justifies the hope that such cases can be given a food of higher caloric value by this method, with less disturbance of nutrition and greater conservation of strength. Dr. Wyman and I are planning more extensive and accurate investigations along this line, through the courtesy of Dr. Bowditch, when the material which the Floating Hospital will furnish is available.

A more practical problem at once suggests itself in the use of mixtures of olive oil and skim milk—especially in combination with the malt soup mixtures.

The type of food which one finds most useful in cases of fat indigestion with extreme malnutrition, is the malt soup mixture. Many of the worst cases are amenable to successful feeding by this method intelligently applied. However, we do meet with failures, and if we are to fairly test the applicability of an homogenized olive oil malt soup combination, we ought to select our cases from those who have been carefully fed in the past and yet failed to respond.

I have chosen olive oil for my first experiments, as olein is the principal fat of breast-milk. The economic aspect of such a mixture, it seems to me, is of immense importance. The principal cost in milk modification depends upon the value of cow's fat or cream. Olive oil even at ordinary retail prices costs about one-fourth as much as cream. If combined with fat-free milk, the cost of a modified milk could be greatly reduced for the benefit of the poor.

Another point in connection with the malt soup olive oil mixtures is the effect of the homogenizing process upon the starch. The tendency for the barley decoction to separate on standing is strikingly overcome. In fact any milk modification is improved in taste and appearance by this process of homogenization. It has been shown that whole milk so treated is more easily digested and assimilated. Homogenization of modified milks might, therefore, increase their efficiency.

In my previous paper I reported the result of 2 cases of difficult feeding in which olive oil was combined with fat-free milk, barley water and maltose. The subsequent history of these cases is included in this paper and in addition the case records of 10 others. These additional cases were selected from the outpatient clinic and were especially chosen, because of their failure to make satisfactory progress under the intelligent and careful feeding which they had received in that department. The results must be judged with this fact clearly in mind, that the previous feeding had in every case been either a failure or unsatisfactory, and the question was whether any material improvement in digestion and nutrition could be brought about by the use of an homogenized olive oil mixture, in place of the ordinary fat-free or low fat mixtures which had been in use.

The case histories have been purposely condensed, for practical reasons, the essential features only being recorded. Most of the weight charts have been plotted, showing gains or losses at intervals of two weeks or one month, with the result that intermediate variations are not always apparent. The intention has been to show the general trend of the weight development during several months of treatment rather than daily or weekly variations, which in out-patient cases are not available nor important.

As regards general symptoms, one may mention certain facts which are noticeable in all of the cases treated, irrespective of the weight development. Vomiting is generally quickly relieved, even when the percentage of fats is the same as in the cream mixtures. The stools in their gross appearance do not differ materially from those which are generally seen when maltose is a constituent of the food. Microscopically, the fat is generally split, fatty acids are rarely found in excess and soaps when present are not in abnormal amounts, though the quantity will vary in the same case, from time to time, without any change in the composition of the food. The frequency of the movements is not influenced by the percentage of olive oil so much as by that of the maltose.

The most striking change is the absence of toxic symptoms, and the vigorous appetite which the child develops. None of the cases has failed to take its full quota of food, and few have shown any discomfort, except from hunger.

In several cases, which have shown a tendency to foul movements, decided improvement has followed the use of bouillon cultures of Bulgarian lactic acid bacilli. These are a valuable adjunct to the food when putrid decomposition threatens to bring about a digestive crisis.

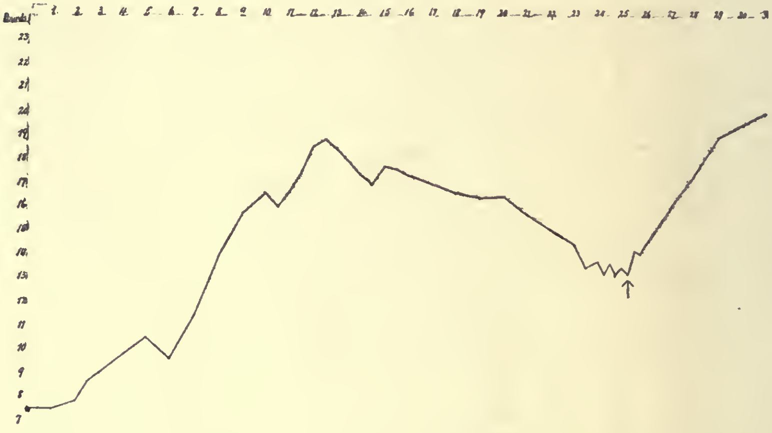
Of the cases I have put upon the homogenized olive oil mixtures at the hospital, there are 3 whose records I have not charted, for various reasons. One, Woodbury, No. 31316, discontinued her visits after six days, although the baby was gaining.

A second, Shaw, No. 31041, gained only 12 ounces in seven weeks, during which time she has had several operations on the neck for cervical glands with abscesses and for adenoids, and lately an attack of tonsillitis. The 12 ounces gained have all been in the last three weeks, in spite of the attack of tonsillitis and the operation for the removal of the adenoids.

A third case, Kennedy, No. 30944, has gained 10 ounces only in two months, or at the same rate as in the previous two months on ordinary milk mixtures. This baby, however, now eight months old, shows a very strong von Pirquet reaction, is subject to attacks of bronchitis and laryngospasms, and is undoubtedly tubercular. In the last two weeks I have tried combining 2.5 per cent. of olive oil in a 1-8 dilution of condensed milk. On this mixture, the baby has gained 8 ounces in fourteen days. This is the only case in which I have used homogenized olive oil to make up the fat deficiency of condensed milk.

Dutch—(Private Ward C. H.) The case of Elizabeth Dutch is the most instructive of all those I have had under observation. She has been fed with homogenized olive oil for six months.

She was a 7½-pounds baby. For two months she was breast-fed and gained about 6 ounces. Substitute feeding was then tried for four months with a gain of 1 pound and 10 ounces only, various modifications with milk sugar, dextri-maltose and Mellin's Food being tried. A wet nurse was then introduced and in six and one-half months she gained 9 pounds and 2 ounces, with only one short, sharp illness caused by adding chicken broth and cereal to the breast-milk feeding. Her maximum weight at twelve and one-half months was 18 pounds 14 ounces.



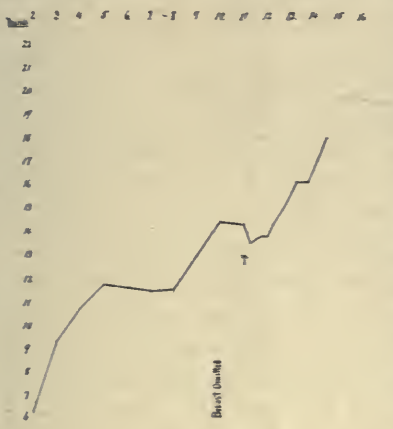
The second year was a history of irregular but progressive loss of weight to 13 pounds 3 ounces. During this time she was fed by experienced pediatrists and every effort made to adapt cow's milk and second-year diets to her digestion. The details of this feeding need not be gone into. The case presented the typical appearance and symptoms of fat intolerance with extreme malnutrition.

The homogenized olive oil malt soup feedings were begun when the child was two years and five weeks of age. In six months the child has gained from 13 pounds 3 ounces to 20 pounds, with corresponding improvement in general condition. In the last three months food of the second year has gradually been introduced and the child is now getting in addition to the olive oil, milk, cereals, broth, rice, macaroni, potato and zwiebach.

The first olive oil formula was started at 1.00 olive oil, 5 maltose, 1.75 protein, 0.75 barley starch with bicarbonate of soda, which was later changed to lime water. This has gradually been increased to 2.75 olive oil, 6.00 maltose, 2.50 protein, 0.75 barley starch, 5.00 lime water. For a time the milk was heated to 212° F.

The stools showed for a short time free fat, fatty acids and soaps, but the gain in weight was rapid, and repeated later examinations have shown no free fat, fatty acids or soaps.

CHARLES OLSEN, No. 28753—An eight-months baby weighing 4½ pounds at birth At two months weighed 6 pounds 6 ounces and was breast-fed entirely until 5 months. From the fifth to the eighth month, the baby made no gain in weight, owing to acute otitis media and pertussis. The breast feeding was continued until the eighth month, when mixed feeding was started, owing to deficiency of the breast milk and failure to gain. From the eighth to the tenth month, the baby gained 3 pounds to 14 pounds 11 ounces, then at ten months the breast milk had dried up and was discontinued.



From the tenth to the eleventh month, on a modified milk of two-thirds whole milk and one-third barley water (3 per cent. starch) with dextri-maltose added, the child lost 2 ounces, grew pale, lost his appetite and had stools full of soaps. He appeared to be on the verge of a severe illness and was, in fact, so weak that I hesitated to experiment with mixtures containing fat of any sort, but as breast milk was not to be had I put him on January 26th on a homogenized olive oil mixture, of 1.50 olive oil, 5 maltose, 1.75 protein, 0.75 barley starch, 5 per cent. lime water, heated to 212° F.

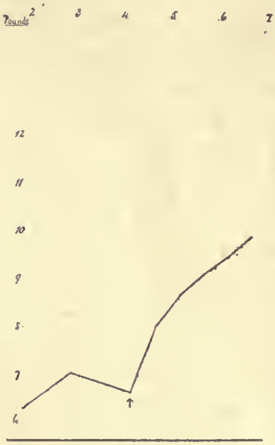
For the first few days he continued to take his feedings poorly and in ten days lost 10 ounces, and the stools still showed a large excess of soaps. The olive oil was reduced to 1.00 per cent.

In the next week he gained rapidly in general condition, put on 3 ounces, stopped vomiting and developed a vigorous appetite. The soaps disappeared from the stools, which were of normal appearance, but slightly loose.

From February 6th to May 18th, there has been a steady gain in weight, from 13 pounds 8 ounces to 18 pounds, a gain of 72 ounces in 101 days, about three-quarters ounce per day. In spirits and general condition the improvement has been even more striking. I have worked the formula up to 2.75 olive oil, 6.00 maltose, 1.75 protein, .75 barley starch, 10 per cent. lime water, heat to 212° F., 48 ounces in 24 hours. The last examination of the stools on May 18th, shows no neutral fat nor fatty acids and a very slight amount of soaps.

This case was very typical of fat intolerance.

Joseph Maddox, No. 30936—Birth weight said to have been ten pounds. Breast-fed one month, then weak home modifications for one month. Weight at first visit (two months) 6 pounds 5 ounces. Fed in O. P. D. from January 15th to March 8th, 7½ weeks with gain of 6 ounces, an average of less than one ounce a week. Last formula of this period was 2.50 fat, 6.25 lactose, 1.40 protein, 20 per cent. of milk and cream, lime water, 7 feedings of 5 ounces. On this the stools showed no fat nor soaps, no vomiting, but a steady loss of weight for two weeks. Energy quotient had been increased from 132 to 173, without materially affecting the digestion or weight.



On March 8th, the baby was put upon an homogenized olive oil mixture:

℞ 1.50 olive oil, 5.50 maltose, 1.00 protein, 0.75 barley starch, 5.00 lime water; heat 212° F.; 8 feedings, 2½-hour intervals, 4 ounces each.

This gave an energy quotient of 127, which was practically the same as that prescribed on his first visit, but with the marked difference that in the first two weeks he gained 22 ounces.

On March 22d (weight 8 pounds 1 ounce), the olive oil was raised to 1.75 per cent. and the protein to 1.25.

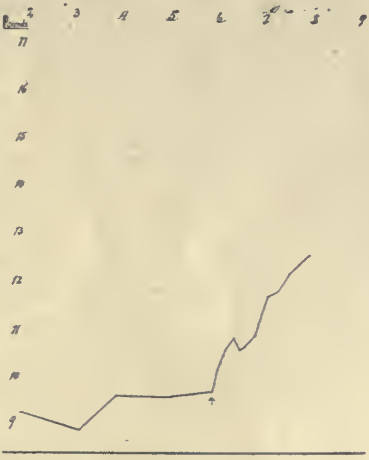
On April 13th (weight 9 pounds 4 ounces), the formula was made: 2.00 olive oil, 6.00 maltose, 1.50 protein, 0.75 barley starch, 5.00 lime water; heat to 212° F.; 8 feedings of 4 ounces.

On May 4th (weight 9 pounds 9 ounces), the milk was changed to: 2:50 olive oil, 6.00 maltose, 1.75 protein, 0.75 barley starch, 10.00 lime water; heat to 212° F., 7 feedings 4¾ ounces.

On May 18th, the stools were non-formed and showed no neutral fats, fatty acids nor soaps. The baby had gained to 10 pounds, making a total gain of 53 ounces in 70 days; compared with a gain of 6 ounces in 52 days, on the previous feeding.

ELEANOR KEOUGH, No. 30489—Birth weight 11 pounds. Bottle-fed from birth, starting with a high fat, with low sugar and protein. (4.00 fat, 1.9 sugar, 0.64 protein.) At the end of two months (time of entrance) her weight was 9 pounds 4 ounces. Stools contained free fat and soaps in excess. The symptoms were vomiting, scalding and loss of weight.

From the second to the sixth month the baby was fed in the O. P. D. as a case of fat indigestion. The vomiting was controlled, but the net gain in weight after four months of feeding was 8 ounces. The last formula used was 1.50 fat, 6 dextri-maltose, 1.00 protein, 10 per cent. of milk and cream, lime water, 7 feedings of 6½ ounces.



On March 8th, the baby was started upon the following homogenized olive oil mixture:

℞ 1.50 olive oil, 6.00 maltose, 1.00 protein, 0.75 barley starch, 5.00 lime water; heat 212° F.; feedings, 3-hour intervals; 5½ ounces in amount.

In three days the baby gained 11 ounces, and fat and soaps disappeared from the stools, and in the following eleven days, 7 ounces.

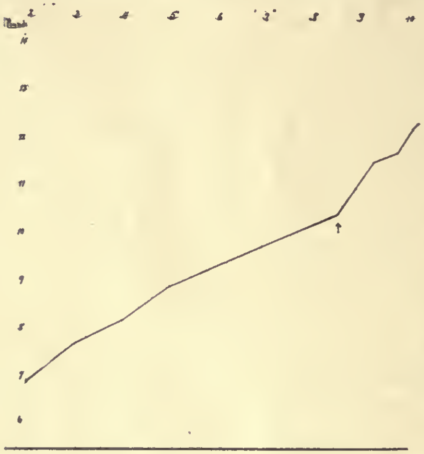
On March 26th, the baby's cold had developed into a hard paroxysmal, strangling cough with vomiting and ran the usual course of pertussis, but in spite of this handicap the gain in weight was continued.

On March 29th, the food was increased to: 1.75 olive oil, 6.00 maltose, 1.50 protein, 0.75 barley starch, 10.00 lime water; heat 212° F.; 32 ounces in 24 hours.

On May 11th, the bowels being somewhat too loose from the maltose, but the baby showing signs of hunger, the milk was changed to: 2.50 olive oil, 5.00 maltose, 1.75 protein, 0.75 barley starch, 10.00 lime water; heat 212° F.; 40 ounces in 24 hours.

On May 18th the stools showed no neutral fat, fatty acids nor soaps. The weight was 13 pounds 5 ounces, or a gain of 53 ounces in 70 days, compared with a previous gain of 8 ounces in four months.

Dorothy Sullivan, No. 30190—Came to the O. P. D. on October 2, 1914, when two months old. Birth weight 7 pounds; present weight 6 pounds 14 ounces. She had been exclusively breast-fed for one month, then was put on cow's milk and water, Imperial Granum, malted milk, etc.



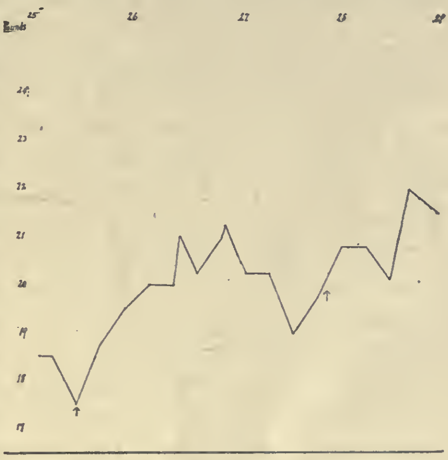
From October 2d to April 14th, for 6½ months, she was fed on a variety of formulæ, most of them malt mixtures with low fats or fats not exceeding 2 per cent., on which she showed undigested fat. She gained in this time 57 ounces, or an average of about 2 ounces a week, and on April 14th showed signs of early scorbutus. Her weight was then 10 pounds 7 ounces, her age 8½ months.

She was given orange juice and put on an homogenized olive oil mixture of: 1.50 olive oil, 5.00 maltose, 1.50 protein, 10.00 lime water, 0.75 barley starch; 42 ounces in 24 hours.

From April 14th to May 18th, she has gained to 12 pounds 6 ounces, or 31 ounces, an average of 6 ounces a week, compared with 2 ounces a week during the previous 6½ months. The olive oil mixture was changed on May 4th to: 2.00 olive oil, 5.50 maltose, 1.75 protein, 10.00 lime water, 0.75 barley starch; 45 ounces in 24 hours.

This she is digesting normally. The signs of scorbutus disappeared after a few days of orange juice.

EILEEN CLARKE—25 months old, was admitted to the wards on January 23d. Her birth weight was 9 to 10 pounds. She was breast-fed for eight months, then fed on barley water, milk, bread and beef-juice. She was admitted with a history of swelling of the feet and abdomen, vomiting, loss of weight. The weight in the O. P. D. was recorded as 23 pounds, but her first weight in the wards four days after entrance was 18 pounds 8 ounces. In the following nine days she lost to 17 pounds 8 ounces on a low fat, low starch diet without milk. The provisional diagnosis was tubercular peritonitis, but the von Pirquet reaction was negative. There was a fluid wave, and shifting dullness, but no tenderness nor palpable glands nor abdominal tumors.



The stools showed a large excess of starch, great excess of soaps and fatty acids and some neutral fat.

On February 1st, the day before her low point of 17½ pounds was reached, the child was started upon an homogenized olive oil milk; *i.e.:* 1.50 olive oil, 5.00 maltose, 1.75 protein, 0.75 barley starch, 5.00 lime water; 48 ounces in 24 hours.

Two days later 2 tablespoonsful of barley jelly were given and the milk increased to 54 ounces. For three weeks there was a steady and striking improvement in the child's condition. The appetite improved, edema disappeared, the disposition improved, and the child had gained 2 pounds.

The olive oil was then raised (on February 20th) to 2 per cent., barley jelly increased and zwiebach given, the calories taken at that time being 1,005. No gain in weight followed and an attempt to increase the amount of food by adding more maltose (0.50 per cent.), and more protein (0.50 per cent.) with broth and rice, resulted in a sharp gain of 1 pound in two days, with nearly as rapid a loss during the next five days.

The history during the next six weeks was unfavorable. The food was changed along the line of reducing the amount of olive oil to as low as 1.00 per cent. In three weeks the child lost irregularly from 21 pounds 4 ounces to 18 pounds and 14 ounces, and then in two weeks with as little reason went back to 20 pounds and 4 ounces.

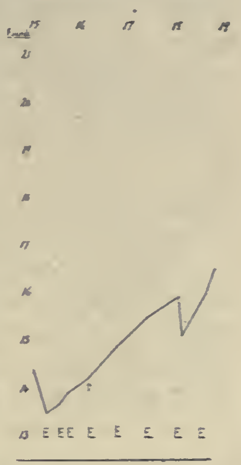
Many examinations of the stools were made. At first there was much neutral fat, soaps and fatty acids; at the end of the first three weeks the baby was digesting its fat, and stools showed only a slight amount of neutral fat, no fat nor soaps (February 22d), but the increase of fat a few days later was followed by fat stools, soaps and fatty acids, which greatly diminished with the reduction of olive oil to 1.00.

The extreme variation in weight in the last six weeks was coincident with marked development of enlarged inguinal lymph nodes, and variable abdominal distention, though no abdominal masses were felt under ether.

As the case seemed to me to be developing symptoms strongly suggestive of tabes mesenterica, in which I felt that any kind of fat was contraindicated, I discontinued the olive oil milk. The child was put on a fat-free modified milk with cereal, zwiebach, bread, one-half egg and potato (calories 1,316). On this, the stools showed only a slight excess of neutral fat and no soaps or fatty acids. The child gained 4 ounces in a week, was sent home, and returned to the O. P. D. a week later having lost 10 ounces. In the next week it gained 1 pound 14 ounces, and in the following week lost 8 ounces.

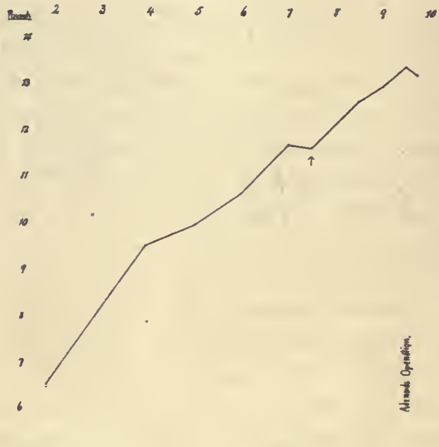
At present the child's abdomen is greatly distended, tense, impossible to palpate and dull in the flanks. If the case eventually proves to be tubercular peritonitis, the explanation of the irregular course of symptoms is easy. If it proves not to be, I must admit that the olive oil mixture in this case of obvious fat indigestion was of no permanent benefit.

Watson—*House Records*—Was admitted to the throat department when 15 months old, weighing 14½ pounds. Birth weight 7 pounds 2 ounces. Gave a history of difficult feeding with vomiting and failure to gain normally. Roentgen rays showed a dilatation of the esophagus at the junction of the lower and middle thirds. The child was esophagoscoped and a stricture found at this point. There was a a family history of syphilis, and the Wassermann reaction on the child was positive. For four months the baby had been dilated under ether at frequent intervals by Dr. Greene. In the first week there was a sharp loss of 1 pound in weight. Since then, there has been a gradual gain, interrupted generally by sharp losses at the time of each operation. At the end of four weeks the baby showed a loss of 4 ounces over her entrance weight, and she was at that time put upon a homogenized olive oil milk, beginning with 1.50 olive oil, 5.00 maltose, 1.75 protein, 0.75 barley starch, 48 ounces in 24 hours, and increasing in strength to 3.00 olive oil, 6.50 maltose, 1.75 protein, 0.75 barley starch. Frequent examinations of the stools have shown the fat well assimilated, no neutral fat, rarely a small amount of fatty acids, but generally none, and either no soaps or a very small amount. The improvement in the baby's appetite and general condition cannot, of course, be attributed to any special virtue of the olive oil mixtures in this case, as an equal gain might have taken place on any kind of feeding due to the dilatations of the stricture.



BARRY, No. 30237—Was brought to the clinic when 7 weeks old, weighing 6 pounds 9 ounces. Child was breast-fed, constipated and gaining slowly. She was admitted to the Infants' Hospital and gained 2 pounds in two months, and when discharged was getting 2.00 fat, 5.00 dextri-maltose, 1.00 protein, 0.75 barley starch. This proved too strong and the baby developed gastric and intestinal indigestion, with some free fat and excess of soaps in the stools. Reduction of the fats and sugar relieved the indigestion, but the rate of gain was slow. In 5½ months of treatment, there was an average gain of 0.45 ounce daily.

On March 20th, the baby was started upon an homogenized



olive oil mixture, 1.50 olive oil, 4.00 maltose, 1.50 protein, 1.00 barley starch, 42 ounces in 24 hours.

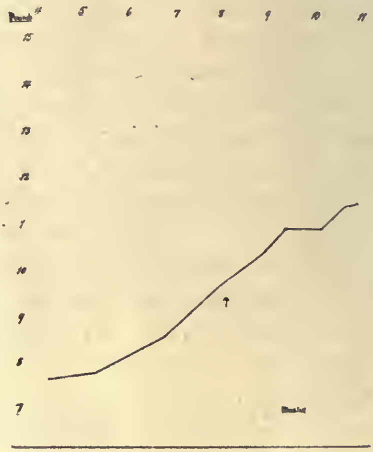
On March 31st, the olive oil was raised to 2.00 per cent., the maltose to 5.00 per cent. and the mixture boiled.

On May 1st, the olive oil was increased to 2.50 per cent., and on May 11th to 2.75 per cent. In 59 days of treatment on olive oil mixture, there has been a gain of 0.4 ounce per day, practically the same as on the previous feeding. The baby has been developing marked obstruction from adenoids, which were removed on May 14th, following which there was a loss of 4 ounces. The last examination of the stools on May 18th showed no neutral fat, fatty acids, nor soaps.

This case shows only that olive oil was as efficient as cow's fat, but no more so. In neither case has the feeding been more than fairly successful, which may be found to have been caused by the excessive growth of adenoids.

Margaret Nichols, No. 30563—Was admitted to the O. P. D. when 4½ months old, weighing 7 pounds 10 ounces. Was then on a 3-6-1 mixture and the stools were "loaded with soaps." She was treated for 3½ months on low fat mixtures, not exceeding 2 per cent., dextri-maltose 4.50 to 5.50 and proteins 1.50 to 2.00. She gained 2 pounds 4 ounces during this period, or about 0.4 ounce a day.

On February 24th, she was put upon an homogenized olive oil mixture of: 2.00 olive oil, 5.00 maltose, 1.40 protein, 0.75



barley starch, 20 per cent. of milk and cream, lime water; 42 ounces in 24 hours.

The stools showed no fat or soaps at this time, but they became loose, and the maltose was changed to dextri-maltose. On May 4th, the olive oil was raised to 2.50 per cent.

Shortly after starting this feeding the child developed measles, and yet in spite of this complication gained 27 ounces in 64 days, or about one-half ounce a day. The improvement in this case so far is only fair, but is at exactly the same rate as on the previous feedings. The last examination of the stools on May 18th showed no neutral fat nor fatty acids, but a slight amount of soaps.

In general, the results obtained in the use of homogenized olive oil as a substitute for cow's fat in cases of difficult feeding are such as to warrant the hope that it will prove a safe and valuable means of administering fat in the so-called cases of "fat intolerance." Its use will not, however, relieve the physician of the necessity of intelligent application of the principles of modification and adaptation of the food to the individual requirements of the infant.

270 Clarendon Street, Boston.

DIAGNOSIS OF TUBERCULOSIS IN EARLY LIFE—H. R. M. Landis and I. Kaufmann (American Journal of Medical Science, 1914, Vol. CXLVIII., p. 530) say that in the diagnosis of tuberculosis in early life the symptomatology is of less value than in adults because they are unable to describe their symptoms. Little reliance can be placed on slight elevations of temperature, because growing children normally have higher temperatures than adults. In children all sounds are normally exaggerated and physical signs are often altered by faulty position or incorrect breathing. In children variations in respiratory excursion are not as significant as in adults. In considering the diagnostic value of enlarged lymph nodes it must be remembered that all children have easily palpable nodes. A positive von Pirquet reaction before two years of age usually means clinical tuberculosis. The chief facts to be decided in regard to a child are whether it is physiologically normal, and if not what is the cause. Whatever the latter may be we should endeavor to correct the child's surroundings and mode of life.

DIAGNOSIS AND TREATMENT OF PYLORIC STENOSIS AND PYLORIC SPASM AT THE INFANTS' HOSPITAL

BY CHARLES HUNTER DUNN, M.D.
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AND
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The class of cases which we wish to report forms one of the most difficult conditions for diagnosis and treatment met with in early life. There is a difference of opinion as to diagnosis, that is, whether there is such a disease as spasm of the pylorus to be differentiated from a severe gastric indigestion, or again, if all severe cases of indigestion showing gastric peristalsis have not a partial stenosis. There is also difference of opinion as to the treatment of the stenosis cases, whether operative or palliative, hoping that whatever spasm is associated with the stenosis will in time be overcome. It is in order to help clear up some of these difficulties in diagnosis and treatment that we report the cases of pyloric stenosis and the cases on which the diagnosis of pyloric spasm has been made at the Infants' Hospital since opening, March 4, 1914.

The examination takes in the following precedures, not all employed in every case, if the case is clear cut or time is of importance. A careful history considering the nature of the feeding, when vomiting first appeared, the character of the vomiting if explosive or if collective, and its relation to feeding time, the size and character of stools, and the loss in weight. The physical examination includes repeated inspection during feeding, observing signs of discomfort, distention in stomach region, gastric peristalsis, and the extent over which the peristalsis is visible, thus giving some idea as to the size of the stomach; palpation with the stomach in activity and when empty and the abdomen relaxed to determine the presence of tumor, and if not sufficiently relaxed the baby is etherized. Aspiration of the stomach contents just before feeding and before the first daily feeding to estimate the retention. The fluoroscope was used to observe the patency of the pylorus. Serial X-rays were taken to demonstrate the patency of the pylorus and the emptying time of the stomach, though we believe the bismuth meal delays the emptying time. During the last four months we have used the duodenal catheter in diagnosis and treatment.

There have been six cases with a diagnosis of pyloric spasm. This diagnosis is made on cases with a history of faulty feeding, vomiting, gastric peristalsis, a patent pylorus as shown by X-ray and the character of the stools, easy introduction of a duodenal catheter, and which are relieved by some change in diet. We believe that this class of cases are bad cases of gastric indigestion, principally from the fact that they are relieved by some change in diet and stomach washing. Our treatment for these cases has been to modify the food according to the element of the food causing the trouble, breast milk if necessary, and daily stomach washing.

Plate 1*a*. Pyloric Spasm, taken fifteen minutes after feeding

The following case will serve to illustrate the group:—

Girl, two and one-half months. Family history is negative, except that the mother is very nervous.

Full term normal baby. Breast-fed. At two weeks began to spit up occasionally, and at four weeks vomited after nearly every feeding. Breast omitted, except at night, for four weeks. Mother gave 2 ounces whole milk every three hours, one-half teaspoonful of gin in water, and some soda bicarbonate in water during the day. This feeding continued till the baby was two months old, when she had a 2-5.50-1.75—the extra sugar Mellin's Food. Vomiting continued, described as explosive at times, never collective. Stools small, but well digested. Slight gastric peristalsis was visible once after feeding, though looked for

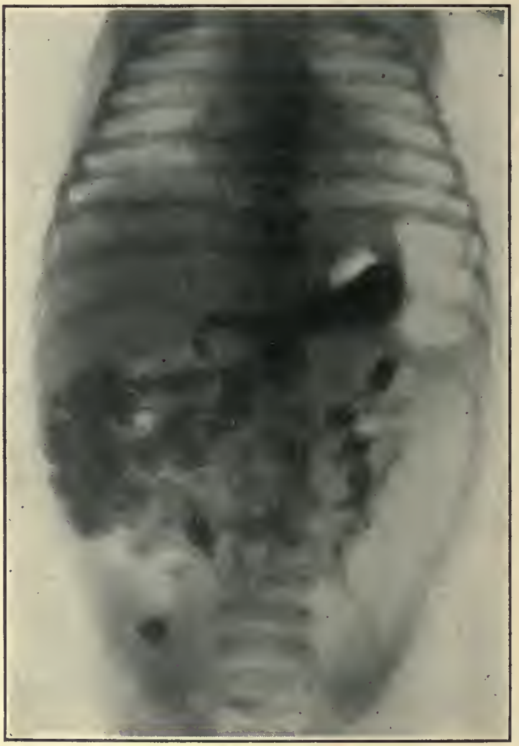


Plate 1*b*. Pyloric Spasm, two hours and a half after feeding. Stomach nearly empty

many times. No tumor. Small amount of residue before feeding for two weeks after entrance. Duodenal tube passed without difficulty. X-ray (Plate 1a) shows immediate passage of food from the stomach; Plate 1b, stomach nearly empty in three hours.

The case was very resistant to changes in food, low fat, change of carbohydrate, and high alkalinity giving no relief. Finally breast milk with extra feeding of 1-6-90/25 gave relief to vomiting. After four weeks in the hospital the baby weighed 2,920 grams, three weeks later 3,470 grams. Since, it has made satisfactory gain, digesting, and vomits occasionally.

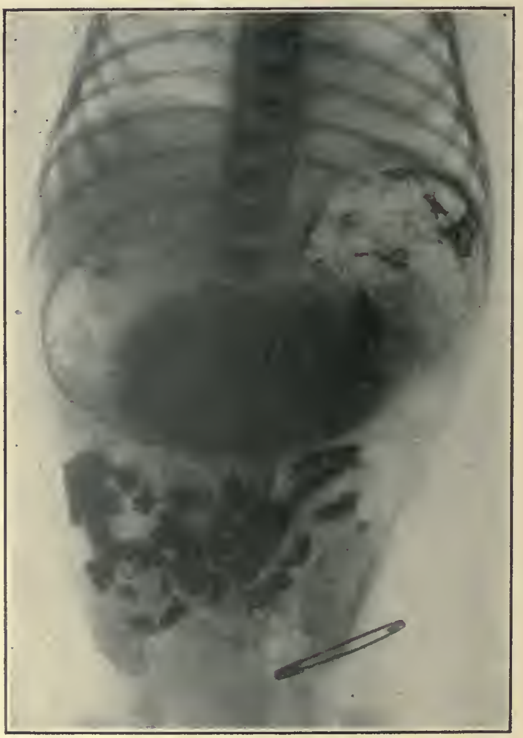
We have subdivided our cases of pyloric stenosis into complete and partial stenosis. There were 6 cases of complete stenosis and 3 cases of partial stenosis.

The diagnosis of complete stenosis was made on the following points: discomfort and vomiting, usually projectile, directly after feeding, unless there was dilatation of the stomach with collective vomiting, peristalsis, tumor, hunger stools, progressive loss in weight. All 6 cases showed these diagnostic points. Five were breast-fed when symptoms began, 1 never breast-fed. Vomiting began suddenly in all the cases from two to six weeks after birth except in the artificially-fed one, which vomited from the first feeding. The peristalsis was marked in each case as contrasted with the spasm cases. Tumor was present in every case and it was necessary to etherize but 1 case to find the tumor, that being easily found afterward without ether.

We believe that such cases of complete stenosis are surgical, that is, the risks from operation if performed by a man accustomed to such operating are far less than from medical means, and the recovery much more rapid. All of our cases were operated by a posterior gastroenterostomy. All but 1 have done well and gave no feeding difficulties after the operation. One case died of intestinal obstruction three and one-half months after the operation for pyloric stenosis. We were unable to find out if the obstruction had anything to do with the stenosis operation.

We have had 3 cases of partial stenosis, and it is with this class of case that we have had our greatest difficulties as to treatment. The cases in detail were as follows:—

Girl, two months premature, admitted when six months old. Began to vomit shortly after birth. Breast-fed, gained for four and one-half months. Was distressed and vomited directly after nursing. Small, well-digested stools. Vomiting increased and at five and one-half months was taken from breast. No gain for past month. Vomiting was not influenced by any change in food, including breast milk and thick foods which could not come up easily. Physical examination showed marked peristalsis over large area, no tumor. Under the fluoroscope the baby became restless, a peristaltic wave could be seen starting at the left, the stomach contract, then a rush of food up the esophagus and a small amount forced through the pylorus. The X-ray showed a very small amount going through the pylorus, marked dilatation of the stomach, and marked delay. There was always considerable residue by stomach tube.



Palte 2. Partial pyloric stenosis three hours and a half after feeding. Stomach occupies whole upper abdomen. Represents result of a neglected case of partial stenosis

The baby was not relieved by changes in food, stomach wash, atropin or any drug treatment tried, and died of bronchopneumonia after surgical interference had been decided upon.

Boy, five months. Vomiting began at three weeks. Breast one month, then various foods, with and without breast milk, tried without relief. Distress and vomiting directly after feeding. At three months might take three feedings and vomit all at once. Frequently vomiting projectile. Stools small, well digested.

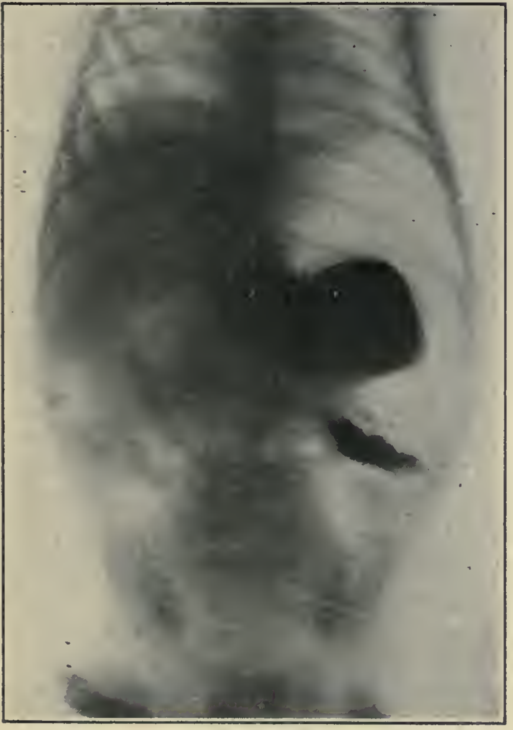


Plate 3. Partial stenosis three and a half hours after feeding

Examination—Small, poorly nourished. After feeding showed very marked peristalsis across the entire upper abdomen and to the level of the umbilicus. No tumor. Always much retention. X-ray (Plate 2) showed a much distended stomach and delayed motility. At operation, tumor found under the dilated thickened stomach. Died eight hours after operation without vomiting or hemorrhage.

Boy, three months; birth weight 8 pounds. Breast only three days and was weaned when six days old on account of vomiting. Various foods without relief. Stools small, well digested. Weight when admitted at three months, 7 pounds.

Physical examination showed a small, poorly-nourished baby. Peristalsis, questionable tumor. Stomach tube showed retention after three hours. Duodenal catheter passed with difficulty.

X-ray (Plate 3) showed delayed motility, very little, if any, dilatation, some obstruction at the pylorus. With daily passage of duodenal catheter and stomach wash vomiting decreased. Weight when four months, 2,810 grams. At the end of four weeks duodenal catheter omitted for four days. Vomiting began and catheter was passed daily for two weeks. Past four weeks catheter has been omitted.

This case is still in the hospital and is doing fairly well, vomits occasionally, digesting and gaining slowly on a 1-6-dextrimaltose-2, lime water 50 per cent. of the milk and cream. Weight, 4,060 grams.

Our diagnosis of these partial stenosis cases depends on the history, which is similar to that of the complete cases, except as to hunger stools; presence of peristalsis, which is usually more marked than with the spasm cases; fluoroscopic and X-ray examination; passage of the duodenal catheter, which goes through the pylorus, but with difficulty; and, finally, that they are not relieved by changes in diet, eliminating one element of the food after another in the attempt to find a possible food factor in causing the vomiting. If a tumor is found of course the diagnosis is made more certain, but it is not necessary to find a tumor for diagnosis.

The treatment has offered many difficult problems. Of course 3 cases are not enough to draw general conclusions from, but general conclusions do not help very much in an individual case and the treatment of these partial stenosis cases must be decided according to the case. In our first 2 cases every means was tried except surgery, because the surgeons hesitated to operate on cases with a partially patent pylorus, unless they did some form of pyloroplasty, which seemed too serious. There have been cases of complete obstruction successfully done by merely splitting the tumor and prying the edges apart, and this form of operation may offer the relief to partial stenosis cases.

Our third case is not yet clearly on the road to recovery, for there has been some more vomiting the past two days. It is more than possible that the daily passage of the duodenal catheter stretched the muscle so that the weak food kept fluid by high alkalinity could pass. Now that the catheter has been omitted for two weeks the muscle may have contracted again and the ultimate result may be that of the first 2 cases.

We believe that cases of partial stenosis as described should be watched, and if there is no relief from vomiting and no satisfactory gain they should be operated on by some operation on the pylorus.

178 Marlborough Street.
279 Clarendon Street.

MENINGISM IN SCARLATINA AND SCARLATINAL UREMIA.—Pierre Mauriac and P. Philip (Ann. de Méd et Chir. Inf., October, 1914) discuss the condition seen in scarlatina when the symptoms are similar to meningitis, but in which the duration of the condition is comparatively short and recovery rapid. They ask whether we should consider this a true meningitis or no. This condition also occurs in the uremia of scarlatina. Weil reports such a case in a soldier who in the course of scarlatina presented symptoms that led to the diagnosis of the cerebrospinal meningitis; the cerebrospinal fluid showed many lymphocytes and the pressure was increased. Still at the end of a few days the symptoms disappeared. Again these meningeal states in scarlatina end in death. The authors conclude that in the presence of a scarlatina we should always be prepared for meningeal complications. When there are no complications in ears and nose, and no uremia, simple meningeal reaction without a true meningitis will explain the condition. But on this meningeal condition in weak children may be grafted all sorts of other infections, which explain acute meningitis in the course of scarlatina. If uremia occurs the meningeal symptoms may be due to intoxication and the prognosis depends on the retention of nitrogen. But when convulsive symptoms appear suddenly with a high temperature and meningeal symptoms we may expect an acute infection added to the uremic intoxication acting on the cerebrospinal axis.—*The American Journal of Obstetrics.*

A CLINICAL AND PATHOLOGICAL STUDY OF 100 INFANTS *

BY
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AND
STANLEY COBB, M.D.
Boston

This paper is a correlation of the clinical and pathological data of two summers' work on the Boston Floating Hospital. The material is presented with very few comments, as we wish simply to present the facts without attempting to draw any conclusions. The clinical studies were made by various members of the visiting staff. There were frequent consultations between these men so that all cases were approached from the same point of view in each instance. The clinical diagnoses of the cases were made from the data obtainable during life, so that the comparisons with the pathological findings represent a check on the accuracy of the observation. The pathological work was all done by one of us (S. C.). During the seasons 1912 and 1913, 110 autopsies were performed. Ten of these are excluded from this study because of poor material, insufficient microscopic examinations or unsatisfactory technique. The gross pathological work was done in the laboratory on the boat and the specimens were taken to the Harvard Medical School for microscopic examination. Portions of each organ were placed in Zenker's fluid and pieces of the kidney, lung and liver in formalin. Hematoxylin and eosin were used as a stain for the Zenker's material and Sudan III or Sharlach R for fat on frozen sections made of the formalin material. Special methods for staining were employed where special organisms were investigated.

GASTROINTESTINAL TRACT

Clinically we recognize three main groups of digestive disturbances in infancy. The first of these is indigestion. These disturbances are caused by errors in feeding, usually by overfeeding in one or all of the various food elements. The symptoms vary according to the food element which is at fault, whether fat, carbohydrate, proteid or salt. The onset may be sudden or gradual and the course either acute or chronic. The

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* From the Boston Floating Hospital and the Pathological Laboratory, Harvard Medical School.

majority of cases eventually recover. Some of the chronic cases die after a very long course. The lesions of the gastrointestinal tract of this group as revealed at autopsy are usually slight and often no cause for death is found. Occasionally there are well-marked intestinal lesions and not infrequently some complication, as bronchopneumonia.

There were 25 cases of this group which came to autopsy and are included in this series. The lesions of the gastrointestinal tract were as follows:—

Normal	12
Marked congestion	1
Catarrhal inflammation	2
Follicular enterocolitis (slight)	5
Follicular enterocolitis (with necrosis)	3
Ulcerative enterocolitis (superficial)	2
Ulcerative enterocolitis (typical dysentery)	0
Membranous enterocolitis	0

At this point it would be well perhaps to give a description of the lesions as enumerated above.

Simple inflammation of the intestinal tract may be merely an acute hyperemia with increased mucous secretion merging into a true catarrhal condition as the process becomes more severe. The mucosa is then swollen and dull, often with collections of stringy mucus adherent. Microscopically the secreting cells are seen to be hyperactive and goblet cells are numerous. Small numbers of leukocytes may be found in the mucus, and the blood vessels are dilated; occasionally small extravasations form punctate hemorrhages.

In the follicular enterocolitis the earliest lesion is a hyperplasia of the lymphoid elements of the solitary follicles and Peyer's patches with hyperemia of the mucosa in general—grayish white follicles standing out on a reddish background. With further hyperplasia dark necrotic spots appear at their centers, going on to ulceration; erosions from 0.5 to 2 mm. in diameter are then formed. Microscopically they look like little volcanoes of lymphoid cells with craters full of detritus, which may be deep enough to ulcerate into the submucosa; bleeding may then occur by connection with engorged capillaries.

Hardly to be separated from this condition is the ulcerative class. When an advanced case is observed with its elliptical and serpiginous ulcers, eschars, and brownish-gray slough, the relation is not seen, but when many cases are compared, it becomes evident that these large lesions are formed by the spreading and coalescence of one or more necrotic follicles. The ulcers are usually confined to the large intestine, occurring most commonly in the ascending and transverse portions; rarely they are found in the Peyer's patches of the lower ileum.

The membranous type is a diffuse process, usually localized in the lower ileum and cecum, although nearly the whole ileum was involved in one severe case. The membrane probably arises from an acute catarrh, the secretion becoming purulent and thick; later by coagulation and fibrin formation it is made into a homogeneous diphtheritic exudate adhering firmly to the wall, so that when scraped off the denuded submucosa is left rough and red.

The second group of gastrointestinal disturbances in infants is less easily defined, but is called "indigestion with fermentation." The etiology is not perfectly clear, but certainly there is more than a simple digestive disturbance, and it is not primarily an infection, yet both elements probably enter into the condition. Apparently it has some association with atmospheric conditions, because these cases are most frequently seen in the summer months and are most common in crowded, poorly-ventilated sections of the city. Clinically this group presents a fairly distinct picture. The onset is sudden, there is fever of short duration, marked prostration, often accompanied by convulsions, and the stools are frequent, green, containing mucus and sometimes blood after the first few days, due to irritation. The mortality is high unless proper treatment is given.

There were 7 cases of this group coming to autopsy. The lesions in the gastrointestinal tract were as follows:—

Normal	2
Marked congestion	1
Catarrhal inflammation	1
Follicular enterocolitis (slight)	2
Follicular enterocolitis (with necrosis)	1
Ulcerative enterocolitis	0
Membranous enterocolitis	0

It will be seen here that the less severe lesions are the ones most frequently found.

The third group is "infectious diarrhea," commonly known as "dysentery." The etiology is bacterial. Several different organisms may cause the disease, but the clinical picture is the same. In general, the symptoms are of two types—digestive and toxic. The digestive symptoms are vomiting, which may or may not be severe, and diarrhea. The stools are watery, green, contain mucus, pus and blood, and are usually accompanied by tenesmus. The toxic symptoms are usually the more serious. They are a high, prolonged fever with marked prostration, loss of fluid as shown by depressed fontanel, sunken eyes, dry skin and scaphoid abdomen. The treatment varies with the type of organism present. When the infection is due to the Flexner bacillus the response to the feeding of carbohydrates is favorable, because this organism produces toxic products only if fed on proteid food. Lactose solution is usually employed. When the infection is due to the gas bacillus the feeding of lactose aggravates the symptoms in the majority of instances, but the feeding of high proteid and low carbohydrates, as lactic acid milk, results in an improvement. The prognosis is much less favorable than in either of the other groups, particularly if treatment is not instituted early.

There were 40 cases of this group which came to autopsy. The lesions in the gastrointestinal tract were as follows:—

Normal	1[*]
Catarrhal inflammation	4
Follicular enterocolitis (slight)	0
Follicular enterocolitis (with necrosis)	17
Ulcerative enterocolitis (superficial)	2
Ulcerative enterocolitis (typical dysentery)	9
Membranous enterocolitis	7

It will be seen from this analysis that the severe types of lesion predominate.

Analyzing still further the 40 cases in which the diagnosis of infectious diarrhea was made, we find that 1 case had no lesions in the gastrointestinal tract, leaving 39 cases for a comparison of the clinical and pathological data. In these cases the organism was determined in 7 cases and a probable differentiation made in 10 more, making together 17 cases in which either the Flexner bacillus or gas bacillus was known or believed to be responsible for the infection. In 22 cases the organism was not determined, which means that neither the Flexner bacillus nor the gas bacillus was found. In many cases an organism was found which might easily have been the cause of the infection, but it did not fulfill all the conditions of any known named organism. The lesions found in these cases were as follows:—

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[*] A note made the day of death says: "Flexner bacilli found. Stools do not look those of infectious diarrhea." The diagnosis was made on the bacteriological report.

Flexner—proved	4—	follicular with necrosis	1
		ulcerative—typical dysentery	3
presumptive	3—	follicular with necrosis	1
		ulcerative—typical dysentery	2
G——as——proved	3—	catarrhal	1
		membranous	2
presumptive	7—	follicular with necrosis	3
		membranous	4
Organism not determined	22—	catarrhal	3
		follicular with necrosis	12
		ulcerative—superficial	2
		ulcerative—typical dysentery	4
		membranous	1
		Total	39

Tabular comparison of clinical and pathological findings in 72 cases having a clinical diagnosis of a disease of the gastro-intestinal tract:—

	Indigestion	Indigestion with Fermentation	Infectious Diarrhea	Total
Normal	12	2	1	‡15
Congestion	1	1	0	2
Catarrhal	2	1	4	7
Follicular, slight*	5	2	0	7
Follicular with necrosis†	3	1	17	21
Ulcerative—superficial**	2	0	2	4
Ulcerative—typical dysentery	0	0	9	9
Membranous	0	0	7	7
Total	25	7	40	72

‡ Pneumonia 3.

* Pneumonia 2.
Pertussis 1.
Congenital heart 1.

† Pneumonia 1.

** Dextro cardia 1.
Idiocy 1.
Lead poisoning 1.

At 91 autopsies the intestinal tract was examined, and in 73 cases pathological lesions were found. This high percentage is explained by the fact that the summer months are most favorable for digestive disturbances and that the Floating Hospital admits many severely or acutely ill patients. The pathological cases were divided as follows:—

Simple inflammations	13
Follicular enterocolitis	33
Ulcerative enterocolitis	20
Membranous or exudative enterocolitis	7

Under the head of simple inflammations 7 of the cases are typically catarrhal and correspond to the description given above. Another showed hyperemia and hypersecretion of mucus in the ileum, with sub-mucous hemorrhages in the colon; this resembled an acute simple inflammation, but as the child was definitely syphilitic in other respects, the intestinal lesions were probably secondary and due to that infection. In 3 cases of tuberculous peritonitis simple inflammation of the enterocolic mucosa was observed, associated with the tuberculous exudate on the serous surface. In 2 cases the congestion was so marked that they deserve a separate classification; there was deep, purple hyperemia of the whole intestinal tract, with dilated small and large blood vessels, but no extravasation.

The follicular conditions were divided into 2 classes, those that had necrosis of the centers of the follicles and those without such necrosis. When an intestine is found with follicular hyperplasia, *i.e.,* easily visible solitary follicles, which stand out pale against the surrounding pink mucosa, it is questionable if the condition is really pathological, for lymphoid hyperplasia is constantly found in infants without any known pathological significance, but since there is every gradation between the slightly enlarged follicles and those with deep, dark, necrotic centers, it was deemed best to classify all those cases where the follicles stood out sharply as follicular ileocolitis or colitis.

Besides the four main types of lesions there were a few rarer or less typical conditions. For example, under the head of ulcerative colitis, strictly speaking, we should enter 7 more cases where ulcers were found in the colon, but these were not to be classified with the true infectious cases, for the ulcers were shallow and diffuse, being simply a loss of mucous membrane with some reddening and thickening of the submucosa. Such lesions were evidently secondary and not of clinical importance. There were also 4 cases of tuberculosis which showed ulceration of the intestinal tract; these ulcers were small, circumscribed, usually round, with raised edges, and showed chronic inflammatory reaction about them. In 1 case the ulcers were in both colon and ileum, in another they were in duodenum and ileum, and in the other 2 they were in the ileum alone.

Tabular view of conditions found in the intestinal tract:—

		Totals
Normal	18	18
Simple inflammations—		
Syphilitic	1	
Tuberculous peritonitis	3	
Marked congestion	2	
Catarrhal	7	13
Follicular enterocolitis or colitis—		
Slight, showing no necrosis	11	
With necrosis	22	33
Ulcerative enterocolitis, enteritis or colitis—		
Tuberculous	4	
Superficial (secondary)	7	
Typical dysentery	9	20
Membranous enterocolitis, ileocolitis and enteritis	7	7
Total		91

URINE AND KIDNEY EXAMINATIONS

The urine was examined in 38 cases which came to autopsy, and microscopic examinations of the kidneys were made in 81 cases. Clinically the urine was classified as (1) normal, (2) irritative, the usual "fever urine," (3), nephritis, (4) pyelitis. Microscopically all cases were considered abnormal which showed any distinct pathological lesions, however slight. The nephropathies were classified in four groups: (1) Cloudy swelling, or acute degenerative tubular nephropathy; (2) acute fatty degenerative nephropathy; (3) acute glomerular or glomerulo-tubular nephropathy; (4) simple congestion, Cloudy swelling is the mildest of these lesions. In this condition the kidney grossly appears pale, without injection of the blood vessels either on the surface or in the cortex; the pyramids are red and the relative measurements of the cortex and medulla show a comparative thickening of the former, which also appears to bulge somewhat. Microscopically the blood vessels and glomeruli are found to contain little blood and the convoluted tubules show swollen epithelial cells. When advanced, this condition became an acute degeneration of the convoluted tubules with granular swollen epithelial cells and pale nuclei, the lumena of the tubules containing a reticular débris.

Acute fatty degeneration presents a somewhat similar appearance in the gross specimen; the kidneys are pale on the surface, but show a network of injected vessels; on section, the cortex, in marked cases, is grayish-yellow with a few red lines indicating the blood vessels; the pyramids are dark red. Cases with less fat cannot grossly be distinguished from cloudy swelling. Microscopically the fat is found in droplets in the bases of the epithelial cells of the tubules. The proximal convoluted tubules are those most commonly attacked, then the distal, and finally, in advanced degeneration, the collecting tubules. The diagnosis can only be made by special stains, either Sharlach R. or Sudan III.

Acute glomerulo-tubular nephropathy, as found in these children, seems to be distinct from the two foregoing types, both pathologically and clinically. It is, as a rule, associated with marked congestion and the kidneys are, therefore, deep reddish purple, both cortex and pyramids appearing dark red on section. The cortex is not swollen and measures about one-quarter the depth of the pyramids, whereas in the cloudy swelling and fatty degeneration the cortex is swollen and the ratio is three to one or less. Microscopically the blood vessels show marked congestion and the capillary tufts are full of red blood corpuscles; in the capsules of Bowman a granular exudate is seen and the tubules contain granular or hyalin casts. (For brevity we will use the term glomerular nephritis for this type.)

A decided congestion of the blood vessels and glomerular tufts without any degenerative changes of the parenchyma nor exudate into the capsules of Bowman was found in a few cases. Grossly these kidneys resemble the glomerular type described above.

In addition to these four conditions which were found most commonly in this series of cases, there was 1 of acute interstitial nephritis, 1 of pyelonephritis, 1 with renal calculi as large as peas, and 2 with gravel in the pelvis.

Analyzing the 38 cases in which urinary examinations were made we find that 22 showed a normal urine. At autopsy these showed: normal kidney, 3; cloudy swelling, 9; fatty degeneration, 4; simple congestion, 2; nephritis, 3; interstitial nephritis, 1. The urine in this last case was examined six days before death. It is fair to say that in many of the cases only a single examination of the urine was made, and this as soon after admission as possible. Many of the patients died a considerable time after that. Eight urines were classified as irritative. Pathological examinations of the kidney in these cases were as follows: Normal, 1; cloudy swelling, 2; fatty degeneration, 2; simple congestion, 0; glomerular nephritis, 2; gravel, 1. Three urines were classified as nephritis and the kidneys showed: fatty degeneration, 2; glomerular nephritis, 1. Five urines were classified as pyelitis and the kidney showed: cloudy swelling, 1; fatty degeneration, 3; glomerular nephritis, 1.

Tabular view of a comparison between the clinical and pathological findings in examination of the urine and kidneys:—

	Normal Urine	Irritative	Nephritis	Pyelitis
Normal kidney	3	1	0	0
Cloudy swelling	9	2	0	1
Fatty degeneration	4	2	2	3
Simple congestion	2	0	0	0
Glomerular nephritis ...	4	2	1	1
Total	22	7*	3	5

* Also gravel 1.

Eighty-one kidneys were examined microscopically; 13 were normal and 68 showed some pathological lesion. The clinical diagnoses of the 13 normal cases were as follows:—

Indigestion	3
Indigestion with fermentation	3
Infectious diarrhea	4
Pneumonia	1
Tuberculous peritonitis	1
Congenital heart	1

The urine was examined in 4 of these cases and found to be normal in 3, and in 1 case of infectious diarrhea to show an irritative condition.

Grouping the 68 cases with pathological kidneys into three groups: (1) acute infections, such as infectious diarrhea, pneumonia, etc., (2) acute non-infectious diseases, such as congenital heart and heat prostration, (3) chronic diseases, the lesions and urinary findings were distributed as follows:—

(1) *Acute Infections*—

					Totals
Cloudy swelling	12	urine	no record	7	
			normal	3	
			irritative	1	
			nephritis	0	
			pyelitis	1	12
Fatty degeneration	23	urine	no record	12	
			normal	4	
			irritative	2	
			nephritis	2	
			pyelitis	3	23
Glomerular nephritis	6	urine	no record	1	
			normal	2	
			irritative	2	
			nephritis	1	6
Congestion	3	urine	no record	1	
			normal	2	3
Gravel	1	urine	irritative	1	1
Acute interstitial nephritis	1	urine	normal	1	1
			Total		46

(2) *Acute Non-infectious Diseases—*

					Totals
Cloudy swelling	5	urine	no record	2	
			normal	3	5
Fatty degeneration	2	urine	no record	2	2
Glomerular nephritis	2	urine	no record	1	
			normal	1	2
			Total		9

(3) *Chronic Diseases—*

					Totals
Cloudy swelling	6	urine	no record	2	
			normal	3	
			irritative	1	6
Fatty degeneration	1	urine	no record	1	1
Glomerular nephritis	3	urine	no record	2	
			pyelitis	1	3
Congestion	3	urine	no record	3	3
			Total		13

Contrasting the incidence of fatty degeneration and glomerular nephritis in the above cases we find that in the acute infections 50 per cent. of the kidneys show fatty degeneration against 13 per cent. showing glomerular nephritis; in the acute non-infectious class there are 22 per cent. of each, and in the chronic diseases there are 7 per cent. of fatty degeneration to 23 per cent. of glomerular nephritis.

TUBERCULOSIS

The skin tuberculin test was applied to 23 patients coming to autopsy. The result of the test was as follows: Negative, 21; positive, 2. One of the positive cases gave a negative test ten days later, the other gave only a very slight reaction and at autopsy there was lobar pneumonia without any tuberculosis. Nine cases in the series of 100 showed tuberculous lesions at autopsy;

4 of these were extensive miliary processes, 2 were tuberculous peritonitis, 1 was tuberculous peritonitis and tuberculosis of the lungs, 1 was tuberculosis of the lungs and 1 was tuberculosis of the peribronchial lymph nodes. A clinical diagnosis of tuberculosis was made in 6 of these cases, indigestion in 2 and bronchopneumonia in 1. The von Pirquet test was applied in 8 of these cases and was negative in all except 1, which showed a positive reaction on the first test and a negative reaction ten days later. Only 1 of the 9 cases gave a history of exposure to tuberculous infection. The duration of the acute symptoms did not exceed two weeks in any instance.

ANATOMICAL AND CLINICAL DIAGNOSES AND VON PIRQUET REACTIONS

Autopsy Diagnosis	Clinical Diagnosis	von Pirquet Test
Miliary tuberculosis	Inanition	Negative
Miliary tuberculosis	?Tuberculosis	Negative
Miliary tuberculosis	Tuberculous meningitis	Negative
Miliary tuberculosis	Tuberculous meningitis	Negative
Tuberculous peritonitis, adenitis, enteritis	Indigestion	Negative
Tuberculous peritonitis	Tuberculous peritonitis	Slightly positive (negative 10 days after first test)
Tuberculous peritonitis Tuberculosis of lungs	Tuberculous peritonitis	None
Tuberculosis of lungs	Miliary tuberculosis	Negative
Tuberculosis of peribronchial lymph nodes	Bronchopneumonia	None

LYMPH NODES

Examination of the lymph nodes was made in 93 cases and comparison made with the clinical histories. It was found that over one-half, or 54 per cent., of the cases with acute gastrointestinal disease showed an enlargement of the mesentery lymph nodes. This raises the question whether or not in many children who have difficulty during convalescence from these diseases in the digestion of fat the problem may be physical as well as physiological because of an obstruction to the lacteals in the mesentery by the enlarged glands. Forty cases in the whole series had enlarged glands and 27 of these, or 67½ per cent., were in acute diseases, 5 in tuberculosis, 6 in chronic diseases, 2 unclassified. Fifty-three cases showed no enlargement; 20 were in acute and 33 in chronic diseases. Microscopic examination of lymph nodes from 32 cases showed that there is atrophy of the germinal centers with increase in size of the nodes, and that this atrophy occurs in acute diseases more often than in chronic; 84 per cent. of the acute cases had atrophy of the germinal centers, and only 50 per cent. of the chronic. It was found that 80 per cent. of the nodes measuring over 6 mm. in diameter, while only 25 per cent. of those measuring 5 mm. or less showed atrophy; probably, therefore, any mesenteric node measuring more than half a centimeter in diameter is, to some extent, pathological.

FATTY LIVERS

In performing a large number of autopsies on infants it is striking to see how many times the livers are loaded with fat, so much so that the organ is a pale yellow, or yellowish-red color instead of the purple-brown color that we usually think of as normal "liver color." It is also impressed upon one that these fatty livers are found in the healthiest and best nourished subjects, and not those which are emaciated from long, wasting diseases. This is in direct contradiction to the usual opinion of the fatty livers as voiced in most text-books of pediatrics.

Rotch (1901) says: "Fatty liver in early life is quite common. . . . It may be found associated with a number of diseases, especially rachitis, tuberculous and wasting diseases, especially with those which are associated with disturbances of digestion. . . . The prognosis, unless the disease is dependent upon some incurable disease elsewhere, is fairly good."

Starr (1894) says: "Tuberculosis and wasting diseases generally are associated with fatty infiltration. The wasting that attends gastrointestinal catarrh is associated with fatty liver. This is particularly the case if the catarrh results from the use of sugar and starchy food. The enlargement is due to an accumulation of fat in the liver, and not to degeneration of the structures."

Chapin and Pisek (1909) say, under the heading "Fatty

Liver": "This condition may be present in various constitutional diseases, especially rickets and tuberculosis. . . . There are usually no symptoms, and treatment of the original disease is all that can be accomplished. If there is little enlargement, the condition cannot be recognized during life, but it is seen to some extent in a large number of autopsies made on young children."

C. Oddo, in Grancher's "Maladie de l'Enfance," gives a list of diseases, embracing nearly all the ills to which children are heir as possible causes of fatty liver.

Holt (1910) discusses fatty livers as pathological, but breaks away from the general trend of opinion by saying: "Fatty liver is not, as has so often been asserted, much more frequent in wasted infants than in others," basing his assertion on postmortem findings correlative with the clinical histories.

R. G. Freeman (ARCHIVES OF PEDIATRICS, February, 1900) goes still further and states that the condition is found usually in acute infections, but rarely in chronic wasting diseases, and very rarely in marasmus. He bases his opinion on a series of 496 autopsies, in which the livers were examined in the gross, but not microscopically.

All these authors have taken for granted that the finding of a large amount of fat in infants' livers is a pathological condition due to toxic or metabolic disturbances. From our experience on the Floating Hospital, where both acute intoxications and chronic metabolic disturbances were met with, it seems a more logical deduction that the normal liver of infancy is one loaded with fat. A clinical analysis to ascertain the length of time each child was sick before death was made in 74 cases in which specimens of liver tissues were preserved and examined microscopically for the presence of fat. It was found almost invariably that those dying of acute diseases, with a short illness, had much fat in the liver, while those which suffered long illnesses had little or no fat. Similarly the general nourishment of the body at the time of death, when compared with the liver fat content, showed that infants who had a good supply of fat elsewhere in the body, subcutaneous and omental, had fatty livers, while emaciated infants had flabby red livers without macroscopic or microscopic fat.

These results are shown in graphic form in two tables; in one the amount of fat in the liver is contrasted with the duration of the disease, and in the other it is contrasted with the general nourishment of the body. For these tables an arbitrary classification of the various factors had to be made. The livers are divided into four classes—A, B, C and D. In class A no fat at all was found microscopically; in B less than one-half of the cells contained fat droplets; in C more than one-half of the cells showed fat; and in Class D practically every cell in the organ contained fat. Similarly the general nourishment of the body is classified as "Emaciated," "Poorly Nourished" or "Well Nourished"; and the duration of the disease as "Acute," "Subacute" and "Chronic." In this last classification diseases were considered "acute" when of less than fourteen days' duration; "subacute" when lasting from fourteen to thirty days, and "chronic" if the course was longer than one month. This is also arbitrary, but considering the class of cases studied it seems a logical division. The severity of the disease is not taken into consideration, and must surely be an important factor, but the grading and classifying of such an unmeasurable factor could not be done with any consistent accuracy, unless some one person observed all the cases throughout the sickness. In Table I. it is seen that the livers of Class C, those containing fat in more than one-half the cells, are found in acute and subacute and to a less extent in chronic disease. These chronic diseases may have been of mild severity, or the child died of an intercurrent acute disease, such as bronchopneumonia. The convincing thing is the fact that 75 per cent. of the livers without fat, Class A, are found in chronic diseases, and that 95 per cent. of the very fatty livers, Class D, are found in acute diseases where the child died quickly before much wasting away was possible, as is shown in Table II., where it is seen that 90 per cent. of the livers of Classes C and D are found in well-nourished or poorly-nourished bodies, while only 10 per cent. of the livers of these classes are found in emaciated ones; and 100 per cent. of the fat-free livers are found in emaciated infants. Turning the figures the other way it is seen that 78 per cent. of the chronically ill patients have lean livers (Classes A and B), while 97 per cent. of those dying of acute infections have fatty livers. To complete the proof that a fatty liver is the normal condition in infancy it would be necessary to accumulate statistics on those autopsies performed on healthy infants dying suddenly from trauma and doubtless all of these would show livers of the fatty type with each cell containing a droplet. This view has been held for a long time by pathologists, for instance, Quinke and Hoppe-Seyler in their article on "Die Krankheiten der Leber" (Nothnagel's "Spec. Pathol. und Therapie," Bd. 18) say that when an individual eats a very fatty diet the excess is stored up not only in the outlying parts of the body, but also in the liver, which is, in fact, a reservoir for fat, as is seen in children who live only on milk.

Table I.

SHOWING RELATIONSHIP BETWEEN THE FAT IN THE LIVER AND DURATION OF ILLNESS

	A No Fat	B ½—	C ½+	D All	
Chronic, over 30 days	6	10	6		
Subacute, 30 to 14 days	2	6	8	1	
Acute, 14 days or less		2	10	20	
	8	17	24	21	70

Table II.

SHOWING RELATIONSHIP BETWEEN THE FAT IN THE LIVER AND THE AMOUNT OF FAT IN THE SUBCUTANEOUS TISSUES

	A	B	C	D	
Emaciated	8	11	4	1	
Poorly nourished		6	14	13	
Well nourished			7	8	
	8	17	25	22	72

LUNGS

The lungs of all cases were examined, and in 54 per cent. bronchopneumonia was present to some extent; sometimes merely a few small areas of consolidation in the bases posteriorly (the commonest finding), but frequently an extensive, active bronchopneumonia. Tuberculous pneumonia was present in the cases of miliary tuberculosis. There was 1 case of lobar pneumonia. Edema of the lungs was present in 15 cases and congestion in 13.

On account of the high incidence and mortality of bronchopneumonia, an effort was made to ascertain some etiological factor. At Dr. Councilman's suggestion a series of lungs showing bronchopneumonia were stained for fat, and the clinical histories were studied to see if there was regurgitation of fatty food shortly before death. Although many of the lungs showed small fat droplets, and many of the cases vomited milk or castor oil in the last forty-eight hours before death, the findings did not coincide definitely enough to make any conclusions possible. The pneumonic process was almost invariably a terminal event in some other disease, but it was no more common in acute sicknesses than in chronic. Hypostasis seemed to be the main factor, as most of the consolidated areas were found in the posterior part of the lungs.

The 18 cases of edema of the lungs were analyzed to see if any possible etiology could be discovered. It was suspected at one time that the use of saline infusions just before death might bring on this condition, but no relationship was found. The 13 congestion cases were diverse in their histories and only 1 had had a saline infusion within six hours of death.

SIZE OF THE STOMACH

The great variation in the size of the stomach postmortem led to speculation as to its cause, whether it was due to postmortem changes, disease, or treatment just before death. To ascertain this all the autopsies which had records of the size of the stomach (and it is fair to suppose that those in which this point was not mentioned had stomachs of normal size) were compared with the clinical records, to determine whether or not the patient had vomited in the last two days of life, had had lavage, or had been fed. Only 14 cases were found where these facts were recorded, but these show quite significantly that lavage and vomiting contracts the stomach, whereas lack of lavage or vomiting leaves the stomach distended. In 3 of the 14 cases the stomach was greatly distended, reaching below the umbilicus, and in none of these had there been vomiting or lavage. Only 2 of the 14 cases had had lavage, and in both of these the stomach was contracted. Both of them had vomited from four to six times during the last forty-eight hours of life. Of the 5 infants who showed a lesser degree of distention, the greater curvature being from 3 cm. below the xiphoid to the umbilicus, 3 did not vomit at all, 1 vomited once and 1 twice. These facts suggest that perhaps the indication for lavage is a distended stomach rather than vomiting, for by vomiting the child is accomplishing itself what lavage merely does more effectively; the child who needs treatment by lavage most is the one with a distended stomach who is not vomiting.

The 3 cases with acute dilatation are not at all similar in their histories; 1 was an acute disease—infectious diarrhea due to the Flexner bacillus; 2 were chronic disease—tuberculous peritonitis, and a long-standing indigestion terminating fatally with bronchopneumonia. In this connection it is interesting to note in the literature that pneumonia in adults is a not uncommon cause of acute dilatation of the stomach. Fussel (American Journal of Medical Science, 1911) finds that chronic wasting diseases are also an important cause of this condition. Conner (American Journal of Medical Science, 1907) also finds that in many of the cases the upper part of the duodenum is also dilated, with a sharp obstruction at the point where it passes between the root of the mesentery and the vertebral column. It would be interesting to examine all subsequent autopsies in infants with acute dilatation with this in mind. The mechanism of the condition is obscure.

329 Beacon Street—Peter Bent Brigham Hospital.

CAUSE OF THE "PHYSIOLOGICAL" LOSS OF WEIGHT OF THE NEWBORN CHILD—George Benestad (Jahrb. f. Kinderhk., July, 1914) considers the possible causes of the so-called physiologic loss of weight of newborn children during the first two weeks of life. The author believes that it is due to an insufficiency of metabolism, especially of the hydrogen-containing materials. In this insufficiency of metabolism intestinal infection plays an important part. This loss of weight cannot be prevented, although its amount and duration is dependent on various factors, the most important of which are the degree of development and original weight of the child, and the amount of milk furnished by the mother. Artificial feeding prolongs and increases the loss of weight, since it makes the establishment of the natural metabolism more difficult. The sooner the infant is able to get accustomed to the ration the better for him, and hence the breast-fed child stands the best chance to have a small and brief loss of weight.—*The American Journal of Obstetrics.*

THE ENERGY METABOLISM OF AN INFANT WITH CONGENITAL ABSENCE OF THE CEREBRAL HEMISPHERES *†

BY FRITZ B. TALBOT, M.D.
Boston

"The cerebral hemispheres, as we have more than once insisted, seem to stand apart from the rest of the brain."

"The salient fact about a frog lacking the cerebral hemispheres is that, as in the case of a frog deprived of its whole brain, the signs of the working of an intelligent volition are either wholly absent or extremely rare. The presence of the bulb or the middle parts of the brain ensure the healthy action of the vascular, respiratory and other nutritive systems; food placed in the mouth is readily and easily swallowed; the animal when stimulated executes various movements, but if it be left entirely to itself, and care be taken to shield it from adventitious stimuli, it either remains perfectly and permanently quiescent, or the apparently spontaneous movements which it carries out are so few and so limited as to raise the question whether they can fairly be called volitional."‡

In warm-blooded animals the removal of the cerebral hemispheres is attended with much greater difficulties than in the case of the frog, while in the mammal it is most difficult. The writer, therefore, reports the results of the studies of a human infant supplied by nature's laboratory.

J. J. M. entered the Massachusetts General Hospital October 24, 1913. He was eight months old and was born February 10, 1913. His birth weight was unknown. Two months before entrance to the hospital the mother noticed that he was unable to sit up, hold his head up, or notice objects as do other babies of the same age. He was said to be a very quiet baby. He had always been breast-fed and had gained weight rapidly, weighing 7,250 grams on entrance to the hospital.

The physical examination showed a large baby with a thick layer of subcutaneous fat. The muscles were felt with difficulty

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* From the Nutrition Laboratory of the Carnegie Institution of Washington, and the Children's Medical Department, Massachusetts General Hospital.

† Presented at the Twenty-seventh Annual Meeting of the American Pediatric Society, Lakewood, N. J., May 24, 1915.

‡ Foster, Sir Michael: "Text-book of Physiology": London, 1898, page 719.

and seemed to be relatively undeveloped. His head rolled about constantly when he was held up. He was slightly pale. The anterior fontanel was slightly depressed and measured 2 x 3 cm. The posterior was closed. He was blind; the pupils were equal, of moderate size and did not react to light. Examination of the fundus by Dr. F. M. Spalding showed optic atrophy with considerable cupping of the disks. He had an idiotic expression. The knee-jerks were equal and lively; there was no Kernig sign, Babinski, or paralysis other than of the muscles of the neck, which apparently were paralyzed. The physical examination was otherwise normal. The Wassermann reaction was negative.

The baby, when left alone, remained absolutely quiet most of the time and did not seem to notice anything. Examination of the ear drums did not show anything remarkable; his actions in the ward gave the impression that he was deaf. Noises around him did not attract his attention. The slightest touch on any part of him always resulted in crying which at times resembled laryngismus stridulus. It seemed as though the reaction to touch was more rapid and more highly developed than in the normal infant. It was necessary to give him his supplementary feeding with a Breck feeder or dropper, but he took the breast well.

His metabolism was determined on October 29th, 30th and on December 10, 1913.

Operation for relief of blindness performed by Dr. W. J. Mixter on November 1, 1913, showed that the hemispheres of the brain were entirely absent and replaced by cerebrospinal fluid. At the base of the skull there were a series of nubs, none larger than a small walnut, the posterior of which probably represented the cerebellum; the optic nerve was recognized. About 8 ounces of cerebrospinal fluid was removed and replaced with normal salt solution.

The Pulse Rate—Each time it was taken in the ward the "baby jumped" and the pulse rate was recorded as between 120 and 140. The findings were different, however, when a stethoscope was attached with adhesive plaster over the heart in such a manner that the pulse could be counted without disturbing the infant. It was then found that the minimum pulse rate (viz., at rest) was 69 to 70 per minute, and the pulse rate during muscular exercise was between 120 and 140 per minute. The highest recorded pulse rate during activity was 176 per minute.

His weight, 8,400 grams, was 330 grams heavier than the

J. J. M.

Date	Body Weight	Body Surface (Meeh)	Height	Age	Actual Length of Period	Carbon Dioxide	Respiratory Quotient	Heat Produced per 24 hours			Rectal Temperature		Average Pulse	Relative Activity	Remarks
						Per hour		Total	Per Kilogram	Per Sq. meter			Rate		
			cms.		mins.	gms.		cals.	cals.	cals.	°C.	(°F)			
Oct. 29, 1913	8.60 kilos.	.432 sq. m.	74	8 mos.	Preliminary - 86	7 36		510			37.4	(99 4)	129	VI	Formula feeding about 2½ hours before the expt.
					Period I - - 23	3 84	0.86	266	31	616	37.0	(98 6)	......	IV	
Oct. 30, 1913	8 43 kilos.	427 sq. m.	73½	8 mos.	Preliminary - 29	5.18		404			37.9	(100 2)	107	V	
					Period I - - 30	3.06		239	28	560*			75	II	Formula feeding about 7 hours before the expt.
					" II - - 23	3.21	0.74	251	30	588*			71	III	
					" III - - 30	5.94		464	55	1087	37.4	(99.4)	94	VI	
Dec. 10, 1913	7.45 kilos.	393 sq. m.	......	9½ mos.	Preliminary - 35½	5.30		409			37.0	(98 6)	115	V	Formula feeding about 1 hour before the expt.
					Period I - - 30	3.38	0.75	261	35	664*			96	III	
					" II - - 30	3.36		259	35	659*			93	III	
					" III - - 30	4.10		317	43	807	37 2	(99 0)	108	V	

Periods marked * were of least activity according to the kymograph records, though the baby was not absolutely quiet in any of the periods weight of average babies of the same age. After the operation he lost weight until November 19th, when he weighed 7,500 grams, after which he gained up to 8,300 grams on November 30th.

The metabolism was determined in the apparatus described by Benedict and Talbot in "The Gaseous Metabolism of Infants."§

The preceding table shows that the lowest metabolism was during periods I. and II. on October 30th, and the highest during period III. on the same date.

The following table shows the comparison between the metabolism of J. J. M. with a normal infant, R. L., of essentially the same age and the comparison of J. J. M. with another normal but very fat infant of approximately the same age but at a different period.

TABLE 2

Subject	Body Wt. without Clothing	Height	Age	Periods	Heat Produced		Pulse rate
					Per Kg per 24°	Per Sq. meter body surface (Meeh)	
	Kg.	Cm.			Cals.	Cals.	
J. J. M.	8.43	73½	8 mos.	2	29	574	73
R. L. (normal)*	7.58	71	8½ mos.	8	59	991	115
J. J. M.	7.45	....	9½ mos.	2	35	661	94
E. G. (normal)*	9.37	74	10 mos.	5	51	907	106

* See Benedict & Talbot: loc. cit.

The comparison of one pathological infant with one normal infant is a distinctly untenable procedure, as has been frequently emphasized in connection with baby metabolism work. Since, however, the metabolism of baby J. J. M. is so extraordinarily different from the large group of normals which have been studied, it seems to be logical to make two selections from the group of normal infants previously reported and to use them here for comparison. Although these infants are not exactly the same age, weight and length as J. J. M., they are as close as can be found in literature and this comparison has a further advantage of being made on different babies examined in the same apparatus and by the same method.

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§ Benedict & Talbot: Carnegie Institution of Washington, Publication, 201, 1914.

It should be emphasized in this connection that E. G., while a normal infant, was fatter than the average baby and for that reason has a lower metabolism than the infant of the same age, but of average weight. The metabolism of J. J. M., as compared to R. L. on the one hand and E. G. on the other hand, is extremely low. Although periods of minimum muscular activity were sought for, the data shows that no periods had a relative activity less than two and that the values with J. J. M. were determined with some visible, recordable activity as shown by the graphic records, while the values recorded for the normal infants used in this comparison had much less activity. This accentuates even more the extraordinarily low values for J. J. M., since the increased activity would obviously result in a somewhat higher heat production than he would have had if he had remained absolutely quiet.

The minimum metabolism in J. J. M. is relatively much lower than that of the newborn infants R. D. and N. H. and of the very fat infants E. F. and H. T.,* none of which produce less than forty-two calories per kilogram of body weight (556 calories per square meter of body surface) (Meeh).

Since this infant was deprived of the volitional areas of the brain, his life was similar to the frog in which the cerebral hemispheres had been removed. He, therefore, did not develop his musculature as would a normal infant of the same age, and, as a result, his body was made up principally of fat and bones with a small amount of muscle.

Were it not for the fact that the temperature remained constant during the time in which he was under observation, one might expect that there was some disturbance in the heat regulating apparatus. Furthermore, he cannot be compared to a hibernating animal, because his temperature remained normal.

The vital functions of this infant were, therefore, carried on at a very low plane because his existence was purely reflex. Unless some external stimulus caused him to move there was little or no muscular activity and as a result only a small amount of fuel was necessary to keep the furnace going.

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* Benedict & Talbot: "Studies in the Respiratory Exchange of Infants," American Journal of Diseases of Children, 1914, viii., I.

THE RELATION OF THE GAS BACILLUS TO INFECTIOUS DIARRHEA AND OTHER DIGESTIVE DISTURBANCES IN CHILDHOOD*

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In spite of the authoritative work of Kendall† great confusion still exists among pediatricians in regard to the etiology and treatment of certain intestinal disturbances of undoubted bacterial origin. Foremost among these is the condition known by various names, in various parts of the country, but under the classification adopted in 1913 by the Department of Pediatrics of Harvard University called "Infectious Diarrhea."

The investigations described in this paper were undertaken with the hope of clarifying to some degree the confusion which characterizes our knowledge of this subject and of working out a uniform and effective treatment, depending upon the etiology of the disease. A hasty review of the literature prior to Kendall's work is sufficient to convince anyone that hitherto treatment has been dependent wholly upon what anyone happened to think was good, or based upon general hygienic principles, rather than upon a knowledge of the bacteria involved in the disease and their specific treatment.

In the course of our investigation it soon became apparent that our work must not be limited to infectious diarrhea alone, whereupon it was extended to embrace the following conditions:

(1) Infectious diarrhea: characterized by fever, prostration, and frequent stools, consisting largely of mucus and blood, due to infection of the intestinal tissues by pathogenic organisms.

(2) Fat intolerance: characterized by the inability of the individual to digest normal amounts of fat.

(3) Carbohydrate intolerance: characterized by the inability of the individual to digest normal amounts of carbohydrates.

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* From the Medical Service of the Children's Hospital.

† A. I. Kendall, Boston Floating Hospital Reports, 1910, 1911, 1912. Boston Medical and Surgical Journal, Vol. CLXIV., No. 9, March 2, 1911. Boston Medical and Surgical Journal, Vol. CLXIX., No. 21, November 20, 1913. Wisconsin Medical Journal, Vol. XII., No. 1, June, 1913.

(4) Chronic intestinal indigestion, sometimes called malnutrition or "marasmus": characterized by the inability of the individual to digest any or all of the three principal elements of food in normal amounts.

The material used came largely from the Medical Out-Patient Department and from the wards of the Children's Hospital, together with a number of cases from the private practice of several of the members of the staff.

Of the latter, however, only such cases have been reported as were followed closely for some time and in which the parents or nurses were of a class which would co-operate with and assist us.

Since our work concerned only the gas bacillus we tested our material for that alone, in our own laboratory. Where other organisms were suspected and at other times, for corroborative purposes, specimens were sent to the Department of Bacteriology of Harvard University, to whom we are indebted for their co-operation and assistance. The test for the gas bacillus was worked out as follows, experience with several generations of students having shown that to one not in practice or not an acute observer, Kendall's technique was confusing and uncertain, whereas, the following test is either positive or negative, even to a non-bacteriologist. The principle of the test depends upon the fact that in any carbohydrate media at suitable temperature the gas bacillus evolves gas, and that boiling destroys all organisms except spores.

Technique for Gas Bacillus Test—

(1) Fill fermentation tube and large test tube with concentrated nitric acid. (This destroys all organisms and spores.)

(2) Pour off acid after three minutes and rinse with hot tap water until neutral to litmus.

(3) With glass spatula (soaked in acid and washed until neutral) place about 1 c.c. dextri-maltose and 1 c.c. of stool in one-third test tube of water. (If stool is solid it must be finely divided in water.)

(4) Boil vigorously one-half minute and pour into fermentation tube, tilting tube back and forth to eliminate bubbles.

(5) Stopper tube with flamed cotton and place in incubator at 37°C. for twenty-four hours.

(6) After twenty-four hours inspect tube for gas and note amount.

(a) Bubble size of pin head or none = negative.

(b) One-half inch = 1 plus (+).
(c) One inch = 2 plus (++).
(d) One and one-half inches = 3 plus (+++).
(e) More than above (++++) or "Blew out the tube."

Frequent controls were made at intervals on the following subjects: Tap water, cold and hot; dextri-maltose (daily), throat sticks (sometimes used as spatulæ), diapers, towels and gauze used as diapers, baby powder and soap sometimes used as suppositories. On the rare occasions when controls were positive all tests relating to that control were discarded for that day. It is interesting to note that both tap waters, throat sticks and soap were uniformly negative. At first the stools were obtained by means of sterile tubes, about 2 inches long, inserted into the rectum. These, however, in view of the extreme rarity of a positive control, were soon discarded and specimens were taken as they were passed in the hospital or brought in on diapers.

At first our tests were limited to cases of clinical infectious diarrhea, but soon extended to other intestinal disturbances, including as well cases without digestive disturbances and 30 cases of babies under two weeks old, the majority of whom were breast-fed, specimens from which were kindly supplied to us from the Boston Lying-In Hospital.

Number of plants, 477; number of cases, 172.
Positive, 369; negative, 108.
Cases positive, 100; cases negative, 72.
The cases were distributed as follows:—

Infectious diarrhea	Positive, 38	Negative, 9
Mixed infection, 4 were positive plus other organism		
Fat intolerance	Positive, 29	Negative, 3
Carbohydrate intolerance	Positive, 3	Negative, 0
Overfeeding	Positive, 1	Negative, 0
Acute intestinal indigestion	Positive, 5	Negative, 2
Chronic intestinal indigestion	Positive, 15	Negative, 4
Not digestive	Positive, 2	Negative, 13
Regulation of feeding	Positive, 1	Negative, 11
Constipation	Positive, 1	Negative, 0
"Indigestion with Fermentation"	Positive, 1	Negative, 0
Breast-fed children under two weeks old	Positive, 0	Negative, 30
	100	72

Ages of the 100 cases reacting positively—

15 were between three weeks and five months of age.
35 between five months and one year.
30 between one year and two years.
20 between two years and seven years. The majority of the 20 were between two and three years of age.

The gas bacillus (bacillus aerogenes capsulatus) is very generally distributed, being found in dust, milk, uncooked food, manure, garden soil, the excrement of animals and of man, and in sewage. According to other observers the gas bacillus is not a normal inhabitant of the intestinal tract of healthy breast-fed infants nor did we recover it from the stools of 30 infants under two weeks of age, neither did we find any case of gas bacillus infection in an infant exclusively breast-fed regardless of age. We have, however, demonstrated its presence in the stools of breast-fed infants receiving supplementary bottle feedings, bottle-fed infants and in children who had no demonstrable intestinal disturbance. Some claim this organism to be usually present in the dejecta of adults, though rarely producing definite symptoms. It has been shown that the gas bacillus grows luxuriously in media high in carbohydrate, and that lactic acid is inimical to its growth and reproduction.

These facts hold true when the intestinal tract becomes the incubator and the intestinal contents the media. The practical application of this in the dietary treatment of gas bacillus infection lies logically in the withdrawal of all forms of carbohydrate and the administration of lactic acid. This is best given in the form of unpasteurized, fat-free lactic acid milk, because it is a food low in fat and carbohydrate; high in proteid and contains free lactic acid as well as living lactic acid bacilli. This should theoretically be the most efficient, for the reason that the free lactic acid contained in the milk is immediately available for its action on the gas bacilli, being carried by the rapid peristalsis associated with the diarrhea commonly present in these cases, to the site of the infection, and has the advantage over the pasteurized milk that its living bacilli are constantly producing new lactic acid, thereby exerting a more intense inhibitory action on, and in changing the intestinal media to one unsuited for, the growth of the organism. The preference of this form of milk over lactic acid bacilli culture administered as such lies obviously in the greater number of bacteria introduced into the intestinal tract by such milk, the less expense, and a more accurate knowledge of the patient's diet.

Treatment—The following treatment has been carried out in the greater number of cases here considered and has proved particularly efficient and practical:—

First: An initial dose of castor oil, sufficiently large to ensure a thorough cleansing of the intestinal tract.

Second: For the first twenty-four hours, or until a definite determination as to the presence of the gas bacillus, the patient is given 5 per cent. lactose solution exclusively. Until a positive diagnosis is made of the presence of the gas bacillus by bacteriological examination it is in our judgment better to give the lactose solution rather than the fat-free lactic acid milk on the ground that the lactose contained in such a solution is very largely utilized as a food before reaching the lower intestine, thereby offering but little pabulum to the gas bacillus. On the other hand, if fat-free lactic acid milk were given, and the condition be due to the bacillus dysenteriæ, very considerable harm would result. Stools were sent to the Department of Bacteriology of Harvard University for further examination in those cases of infectious diarrhea which showed the gas bacillus absent after twenty-four hours incubation. Cases showing the bacillus dysenteriæ were treated according to the methods advocated by Kendall. In most cases where the stools showed the presence of gas bacillus such cases were treated as of gas bacillus infection and given unpasteurized fat-free lactic acid milk. Where the infants were under four months of age it has been our custom to give the fat-free lactic acid milk diluted one-half with boiled water, owing to the relatively high proteid for a child under this age, the amount and number of feedings in all cases of bottle-fed babies being as near as possible in direct proportion to their normal feedings; and in older children 1 to 2 quarts per twenty-four hours. In those cases where more or less difficulty was experienced in getting the patients to take the lactic acid milk, owing to their apparent dislike of its taste, their natural prejudice against any change in diet or from a loss of appetite, the following expedients were found to be helpful:—

(1) Dilute lactic acid milk with water.
(2) Sweeten with saccharin.
(3) Withhold all water.

(4) Feed by spoonful at frequent intervals until accustomed to the taste.

In the profoundly sick cases forced feedings may have to be resorted to, though we have found this rarely to be necessary when the other methods were tried conscientiously. It has been our experience that most infants and children take this lactic acid milk readily. In every severe case supportive treatment should naturally be used during the first twenty-four hours until a diagnosis can be accurately determined, and should not be neglected if necessary until the child begins to show improvement following the administration of the fat-free lactic acid milk. This latter has seldom been necessary in our experience, inasmuch as most cases have shown a marked improvement within a few hours following the administration of the milk.

ILLUSTRATIVE CASE NO. I

Infectious Diarrhea—I. C., seven months.

Family History—Not important.

Past History—Breast-fed up to two months ago, then given milk and water equal parts.

Present Illness—Diarrhea for three days, vomited. On first day refused all food and water, movements 15 i. d., green, watery, curds, mucus and blood. Has seemed feverish, cries a good deal.

Physical Examination—Well developed, prostrated. Anterior fontanel sunken. Abdomen tender. Nothing else notable. Stool passed, green mucus with flecks of blood. Temperature, 101°F.

July 11, 1914: ℞, Castor oil, 2 teaspoonfuls; lactose, 5 per cent. solution only. To report in A.M. Stool planted for gas.

July 12, 1914: Stool 3 plus (+++) gas. Child no better, movements the same, looks badly. ℞, Fat-free lactic acid milk, nothing else. To report in A.M.

July 13, 1914: Took about 4 ounces of fat-free lactic acid milk only. Looks better, stools still frequent, mucus and blood. ℞, continue.

July 14, 1914: Seems better, took 24 ounces. Is brighter and happier. Temperature, 99°F. Stools (4) i. d. fecal, some mucus, no blood. ℞, continue.

July 15, 1914: Took 48 ounces. Seems fine. Hungry. Sleeps between feedings. Movements 2, i. d. smooth, yellow, salve-like, no curds, mucus or blood. ℞, continue. ℞, plant stool.

July 17, 1914: Seems perfectly well. Gained 9 ounces in last two days. Stools 2 i. d. characteristic high proteid. No gas, mucus or blood. Gas plant negative.

This child was then given 1 pint fat-free lactic acid milk daily, in addition to a low fat formula, and did perfectly well.

ILLUSTRATIVE CASE NO. 2

Infectious Diarrhea—Gas Bacillus and Other Organisms—B. S., thirteen months.

Family History--Not important.

Past History—Full term, normal delivery, breast-fed eight months, then modifications and infant diet. Always perfectly well. Weight at one year 22 pounds.

Present Illness—(On country milk.) Five hours ago vomited and had a convulsion; was perfectly well yesterday and has had nothing unusual to eat. Movement this morning was a little loose. Since convulsion has had a small movement mostly of mucus and blood every few minutes. Mother thinks child has had 50 movements in the last five hours. Child has been very feverish since onset and has refused all but occasional sips of water. Has vomited four or five times.

Physical Examination—Well developed and nourished. Looks badly, prostrated, apathetic. Acetone (?) breath. Eyes bright. Temperature, 102.5°F. Abdomen tender, not otherwise notable. Stool passed, about 2 drams green mucus flecked with blood (pink). No fecal material. Castor oil was given—2 drams. Colon irrigation every five hours. Lactose 5 per cent. solution forced and a stool planted which was double plus (++) in twelve hours. Child at that time looked worse than at first examination.

Lactose and irrigation was then omitted and fat-free lactic acid milk alone given, which the child took eagerly. In twelve hours the child was a little better and a favorable prognosis was given. The milk was taken readily, 48 ounces daily for the next four days, during which the gas plant remained plus (+) to double plus (++) and the stools remained as before, plus some fecal material. The temperature remained at about 100° and the child lost weight rapidly. On the sixth day the gas plant was negative, the child was getting worse, so a stool was sent to the Department of Bacteriology of Harvard University from which bacillus dysenteriæ was reported.

While waiting for this report the diet was changed to a 5 per cent. lactose exclusively, with a slight improvement in movements and general condition. After receiving report, excess starch with no fat or proteid was given, from which time the child improved very rapidly.

ILLUSTRATIVE CASE NO. 3

Chronic Intestinal Indigestion—D. B., boy, fifteen months, only child of healthy parents, born after normal pregnancy at full term. Was breast-fed for nine months, then given various foods. For the last two months has had modified milk calculated to fat, 5; lactose, 3.75; b. s., 50—42 ounces daily. Has seemed to digest that very well; lately has been given crackers, toast and soups. Had an upset in July (two months ago) characterized by loose, watery movements with a great deal of mucus; was quite sick for several days, but gradually got better, although stools have frequently contained mucus since. Has not gained any in weight, mother thinks child is losing. Child is irritable and peevish most of the time and whines as if uncomfortable, restless at night. Mother sure child has not been feverish.

Physical examination revealed nothing definitely abnormal, except that the fontanel was depressed, child was pale, extremities cold, abdomen protuberant and lax, rather doughy feeling, not tender, no masses. Specimen of stool obtained at visit was grayish yellow, spongy, contained no mucus and seemed to consist wholly of fat as soaps. Up to this point the child seemed to be an ordinary case of fat-overfeeding, but a routine "plant" for gas bacillus "blew out the tube" in twenty-four hours. This was one of our earlier cases, in which the probability that the gas bacillus might be at the bottom of the child's trouble was not brought home until it was found that the child's fat-tolerance was practically zero and that his symptoms did not abate on a fat-free diet. During the two weeks after the first visit gas plants at three-day intervals uniformly "blew out the tube."

The child was then as peevish, irritable and apparently uncomfortable as before and the stools were still spongy, occasionally containing mucus, although free from fat.

It was then decided to assume that the upset two months previous was a gas bacillus infectious diarrhea, and to treat the child accordingly.

Inasmuch as at that time our experience in this type of case had not crystallized into any definite programme, we will give you this child's treatment in detail. He was first given fat-free unpasteurized lactic acid milk—3 pints daily; no other food until the stools were negative for gas, which took place after four days, during the last two of which the stools appeared to be normal buttermilk stools, and the child appeared to be much happier and livelier, although crying and in other ways definitely indicating that he was hungry. On the assumption then that a negative gas plant meant the permanent disappearance of the gas bacillus from the intestines, the child was given fat-free milk (1 quart) and well-cooked starches to about 300 calories additional, which he took eagerly. After two or three days he then became peevish, irritable and uncomfortable, movements spongy—contained excess of starch and the gas "plant" again "blew out the tube." He was then put back on fat-free lactic acid milk, unpasteurized, until he had had three negative gas plants at two-day intervals, which occurred on the fifteenth day. During these fifteen days he improved rapidly in color, activity and disposition, but was very hungry—he lost ½ pound. He was then given fat-free lactic acid milk, 1 pint daily; skim milk, 1 quart for another week, at the end of which, the gas plant still remaining negative, small amounts of well-cooked starches were added. He remained well and gained weight rapidly, but was still very hungry, so additional proteid was added in the form of egg-white and beef juice. He continued to do well up to the time when he was taking 950 calories, as above, and the stools remained negative for gas. About six weeks after the first visit the parents decided to give him home-made skim milk, omitted buttermilk and increased his starches so that his diet represented about 1,250 calories. After approximately two weeks on this he became pale again, listless, peevish, irritable and whiny. Movements spongy, contained mucus, large amounts of starch, no soap, gas plant +++.

(It is a question here as to whether he got some new gas bacilli from the local milk or whether the excess of starch, together with the absence of the lactic acid bacilli, allowed some remaining bacilli to grow again.)

He was immediately put on the second programme as described, namely, fat-free lactic acid milk, until three gas plants at two-day intervals were negative, then 1 pint daily plus skim milk, plus extra proteid, and, last, plus very well-cooked starches very gradually added. Has improved uninterruptedly ever since. After about four months, still on laboratory milk, fat was added, ½ of 1 per cent. at a time, until he is now taking 3½ per cent. He has shown no excess of fat in stools and is now a healthy, pink and rosy, happy, hungry baby. His mother volunteers the information that as she looks back over his sickness, the most definite change has been in his increasing irritability for the two months following his first upset, followed by his startling improvement in disposition, except at the time of his two minor upsets occurring during our treatment. This represents a type of chronic intestinal indigestion with inability to digest fats and more than small amounts of starches, characterized clinically by failure to gain or actual loss in weight, change of disposition, peevishness, restlessness and an appearance of being uncomfortable, pallor, varying degrees of abdominal distention and by movements apparently fairly well digested, but spongy and often containing mucus. This type has been practically uniform in the clearing up of the above symptoms, when our tests of the gas bacillus have become negative and their recurrence when the gas bacillus reappeared.

ILLUSTRATIVE CASE NO. 4

Fat Intolerance—The second type of chronic intestinal indigestion which we have come to associate with the presence of the gas bacillus is that of an inability to digest a normal amount of fat. In practically every case where gas bacillus gave a fairly large test, that is to say, what we call ++, +++, or "blew out the tube," whether the child had had infectious diarrhea or not, it has been found that for months following, the child's tolerance for fat was extremely low and that it was regained very slowly. This has been shown to be true of cases with normal fat-tolerance *previous* to an infectious diarrhea due to the gas bacillus, following which the fat-tolerance dropped almost to zero. We do not mean to say that all cases of fat-intolerance are due to the gas bacillus, for we have cases of fat-intolerance where the gas bacillus is persistently absent. Conversely, however, the evidence does seem to point to the conclusion that all cases of proven gas bacillus infection have following them a long continued intolerance to fat.

Infectious Diarrhea—The 47 cases of infectious diarrhea positive to gas and those negative to gas were clinically indistinguishable in onset, prostration, character of stools and diet history immediately preceding onset. None were exclusively breast-fed. Treatment was then necessarily based upon the bacteriological peculiarity of the invading organisms, except for the first twenty-four hours required for the gas test, during which the cases were cleaned out and put upon 5 per cent. lactose solution, on the ground that if gas bacillus existed, so little carbohydrate entered the lower intestine that little harm was done, whereas, if the case later proved to be a bacillus dysenteriæ the premature administration of fat-free lactic acid milk would have done considerable harm.

Of the 38 cases positive to gas bacillus, 31 were treated by fat-free lactic acid milk unpasteurized. Most of them took it readily enough; with some it was necessary to sweeten with saccharine, dilute with water, or even to use physical force. No other food whatever was given. Of the 31 cases 2 were moribund on admission. One died in a few hours after treatment was instituted, another within forty-eight hours. Leaving these 2 out, of 31 cases of infectious diarrhea, whose onset varied from a few hours to three or more weeks, 29 were clinically well in a maximum time of *five days,* that is to say, the stools were *normal* appearing buttermilk stools containing no mucus or blood, although occasionally microscopic pus persisted until the tenth day. Most of the cases showed normal stools within seventy-two hours. The most striking change was in the appearance of the "sick" cases, where within a few hours in some, within twenty-four hours in most, a great improvement in general condition was notable. The gas bacillus persisted in these stools in diminished numbers, in most cases up to the fifth day, in 1 to the fifteenth day, and in 1 for five months and is still present, although the child is doing fairly well.

The 4 cases not clinically improved did improve a little at the start—each was gas bacillus-free in five days, but gradually got worse, still presenting a typical picture of severe infectious diarrhea. Gas bacillus-free stools from these cases were sent to the Harvard Medical School, where "bacillus dysenteriæ" was reported. They were, therefore, cases of mixed infection.

Of the 38 cases 7 did not receive any fat-free lactic acid milk, but were treated by the "old routine," *i.e.,* cleaned out, started on 5 per cent. lactose, then given low starch for several days, then low proteid gradually increasing, and, last, cautiously adding fat. These 7 showed gas bacillus persistently for weeks and months. All showed a gradual subsidence of evidence of infectious diarrhea, 1 in seven days, 1 in ten days and the rest within three weeks, none died, none had movements normal in number or appearance for weeks. Three were given fat-free lactic acid milk exclusively after three to five weeks, on account of failure to gain, persistence of gas bacillus and occasional reappearance of mucus and blood. Within four days, after having the lactic acid milk, each had normal movements and was clinically well except for persistent intolerance to fat.

Fat Intolerance—Of the cases tested not presenting symptoms of infectious diarrhea, 32 were typical cases of fat intolerance. Of these, 29 were positive to gas and 3 were negative. Of the 29, 10 definitely and several indefinitely had histories of previous acute digestive disturbances with frequent stools containing mucus, following which they had not gained on the same fat upon which they had been previously doing well. Nine had a definite story of fat overfeeding. The 3 cases negative to gas had no history of initial intestinal disturbance, but all had had high fat mixtures. Of the 29 cases, 20 approximated pretty closely the type case. All were given fat-free lactic acid milk till gas bacillus free, and all showed a rapid improvement in general condition and disposition coincidently with the disappearance of the gas bacillus from the stools. In none of these, however, was normal fat tolerance resumed for months.

While not susceptible of proof, their appearance and general condition seemed to be several degrees more severe than cases of fat intolerance with fat intoxication, and their improvement with the administration of fat-free lactic acid milk was greater and more rapid than one expects with the ordinary treatment of fat intoxication in fat intolerance.

Chronic Intestinal Indigestion (Fat and Carbohydrate)—Of 19 cases with the above diagnosis, 15 were positive and 4 were negative. Of the 15 positive cases 11 received fat-free lactic acid milk and when gas bacillus-free were able to handle a higher proteid than when their stools contained gas bacillus; appeared better in general as to color, general condition and disposition, although gain in weight was usually slow. Recurrence of gas bacillus took place on the addition of a larger amount of carbohydrate, whereupon the proteid tolerance again diminished, to increase again when the gas bacillus disappeared. Of the 4 cases positive not receiving fat-free lactic acid milk, all persisted until lost sight of (months) in feeling and looking badly, disposition poor, and stools showing excess of food elements and mucus.

Carbohydrate Intolerance (Sugar and Starch)—Of this condition there were 3 cases, characterized by stools, typical of carbohydrate fermentation, when the carbohydrate intake (sugar and well-cooked starches) was very low. All were positive to gas bacillus. All received fat-free lactic acid milk until gas bacillus-free. All still show intolerance to any but small amounts of carbohydrate except maltose.

Acute Intestinal Indigestion—Only 7 cases were tested for gas bacillus; 5 were positive. These received fat-free lactic acid milk until negative and then resumed their ordinary feeding without further trouble. Is there a probability that these were true infectious diarrheas caught early?

Overfeeding—One case, positive. This child was three years old and getting a very bad general diet of enormous quantity. She came in for epilepsy of some months' standing. Stools were large, spongy, foul, contained some mucus, no blood, large quantities of muscle fiber, cellulose and starch. She was given fat-free lactic acid milk till gas bacillus-free, then 1 pint of fat-free lactic acid milk and carefully chosen diet to 1,250 calories. Has been well since, no convulsions (seven months).

Question—Did getting rid of the gas bacillus have anything to do with this, or was the result due to putting the child on a normal diet?

Regulation of Feeding—All under one year, of 12, 1 was slightly positive. Eleven were negative. The one positive received no fat-free lactic acid milk and did perfectly well.

Constipation—One case, stools did not contain an excess of fat; feeding regulated. No fat-free lactic acid milk. Did perfectly well.

Non-digestive—Two positive, 13 negative. Ages, three months to ten years. The two positive were 1 + to gas, ten and eight years old. The children received no fat-free lactic acid milk, as there was no indication for treatment.

The relation of amount of gas evolved in the fermentation tube (which may be taken for a rough estimate of the number of bacilli present), to the severity of the symptoms is not definitely shown, except that in the very severe cases of infectious diarrhea, +++ or "blew out the tube" frequently occurred, as well as in cases where there was much excess starch. No severe cases, however, had as little as 1 +. Our cases were as follows:—

CASES

Infectious diarrhea	1 plus	0
	2 plus	12
	3 plus	21
	"Blew out the tube"	5
Mixed infections	1 plus	0
	2 plus	1
	3 plus	3
Chronic intestinal indigestion	1 plus	3
	2 plus	2
	3 plus	5
	"Blew out the tube"	5
Carbohydrate intolerance	"Blew out the tube"	3
Fat intolerance	1 plus	6
	2 plus	20
	3 plus	2
	"Blew out the tube"	1
"Feeding"	1 plus	1
Non-digestive	1 plus	2
Constipation	1 plus	1
Fat overfeeding	1 plus	1

The following tests were made with active cultures, *i.e.*, ones which "blew out the tube," and both fat-free lactic acid milk unpasteurized and pasteurized. A "blown out tube" was filled with equal parts of tube contents and lactic acid milk and tilted to eliminate all bubbles and incubated for twenty-four hours. Of the 5 so replanted with unpasteurized lactic acid milk none showed gas; of 3 so replanted with pasteurized lactic acid milk, 2 showed 1 + after twenty-four hours and 1 showed a small bubble, but was called negative. Both lactic acid milks had been titrated to 1 per cent. acidity.

From our experience in the study and treatment of these cases we have come to observe the following routine:—

(1) To give unpasteurized lactic acid milk exclusively until the stools are gas bacillus-free for 3 successive plants at two or three-day intervals.

(2) When gas bacillus-free, (*a*) continue a small amount of lactic acid milk daily; (*b*) gradually increase the amount of food to normal caloric requirements by adding skim milk and cautiously small amounts of carbohydrates, preferably in the form of maltose and very well cooked starches, testing for gas from time to time.

(3) Add fat to the diet after weeks or months, in very small amounts, watching stools frequently for undigested fat.

(4) When there is a recurrence of the gas bacillus, treatment should be repeated.

This treatment was used in our cases where the gas bacillus was present as follows:—

Infectious diarrhea, 31 cases, of which 2 died (were moribund on admission); 29 got clinically well within five days. Of the 9 not so treated none got well within weeks, and 3, after weeks of "old routine" treatment, were given the above and got well in four days. Of the 4 mixed infections none really improved. Of cases of fat intolerance 20 were so treated and rapidly became free from symptoms of disturbed metabolism; 9 not so treated showed persistent evidence of disturbed metabolism. Of the cases of carbohydrate intolerance all showed marked improvement in stools. None did not receive the above treatment. Of the 15 cases of chronic intestinal indigestion 11 were so treated and immediately improved, although recurrence took place in most of them, to be immediately relieved by the return to the fat-free lactic acid milk. Of the 4 not so treated all persisted for months.

Fat-free diet has been adhered to in all of these cases because as has been shown so many times hitherto the digestion of fat is disturbed for considerable periods following all cases of infectious diarrhea. Of the cases doing well on unpasteurized fat-free lactic acid milk, 5 received for a short time pasteurized fat-free lactic acid milk. In each of these cases improvement immediately abated, although none had an actual recurrence. Upon returning to the unpasteurized lactic acid milk improvement was again rapid.

While the above evidence falls short of actual demonstration in that it fails to satisfy the requirements of Koch's law, and does not prove that no other pathogenic organism (with the exception of the mixed infections above noted) was present in the intestines concomitantly with the gas bacillus, nevertheless, the association of symptoms in these cases with the presence of the gas bacillus, and the subsidence of these symptoms coincidently with the disappearance of the gas bacillus forces us to these conclusions:—

(1) The gas bacillus is not a normal inhabitant of the intestinal tract.

(2) Its pathogenicity is apparently demonstrable in certain cases of infectious diarrhea, fat intolerance, carbohydrate intolerance, and chronic intestinal indigestion.

(3) The dietary treatment by means of fat-free lactic acid milk unpasteurized, by imposing conditions unfavorable to the growth and activity of the gas bacillus, is rational, safe, and more immediately effective than any other treatment so far advocated.

BRONCHOTETANY—E. Wieland (Monats. f. Kinderhk., Bd. XIII., Nr. 5, 1914) describes bronchotetany as a spasm of the bronchial muscles, causing dyspnea. It is often fatal. At autopsy, in spite of a diagnosis of pneumonia, there is found no lesion of the epithelia of the lungs, or of the heart, either macroscopic or microscopic. There may be present no other symptoms of spasmophilia. Out of 58 cases of spasmophilia Lederer found 6 of bronchial spasm. All six were fatal. There is found dullness localized over areas of atelectasis. A Roentgenogram of the lungs shows no dark area, as in pneumonia, but a diffuse, lighter shadow of atelectasis. Differential diagnosis is made by the X-ray picture only. Therefore we find that bronchotetany shows a sharp clinical and anatomical symptom-complex. The prognosis is bad. The Roentgenogram combined with the symptoms and general spasmophilic state of the child assist in the differential diagnosis. Light forms of pneumonia show almost identical symptoms; but their prognosis is munch better.—*The American Journal of Obstetrics.*

SOME MEASUREMENTS OF NORMAL CHILDREN, ESPECIALLY OF THE LEG AND ARM. SOME INTERESTING DEDUCTIONS AND PRACTICABLE POSSIBILITIES*

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It is a generally known fact that the extremities are shorter than normal in chondrodystrophia, cretinism and Mongolian idiocy. The same condition may also hold in rachitis and in osteogenesis imperfecta. Just how much shortening there may be, is at present an almost unknown quantity. The literature has very little light to shed on the subject. Holt† gives a few figures on the relation in percentage of the length of the leg to the total height in a few normal cases. The results of his investigation along this line have been too superficial for practical value, and have been used very little by other men, as far as I can find.

The lengths of the long bones have been measured in health and disease by several investigators, but this again has proved a more or less difficult feat, and never of practical value in the above-mentioned conditions.

At Dr. John L. Morse's suggestion, the task of measuring the total length, the length of the leg, and the length of the arm was undertaken, and about 500 normal children have been studied with that in view. At the same time other measurements were done on the same children in the hope that they might prove of some value later on. These consisted in the circumference of the head, the circumference of the chest, and the anteroposterior dimension of the head from the glabella to the posterior occipital protuberance. The weight was recorded in almost every case. The sex was noted. The age was always recorded in years and months.

Most of the children were among the out-patients of the Children's Hospital, many of the older one being relatives of the patients. Some were bed patients in the wards. Others were measured at the milk stations of the Milk and Baby Hygiene Association, while a few were at the Boston Lying-In Hospital. A number also were private patients.

Great difficulties were encountered in doing the actual measuring, especially in infants and frightened children. The head and chest measurements were comparatively easy. In measuring the height and length of leg, however, it often required extremely firm pressure on the knees to keep them flat on the table. Also in measuring the arm, the elbow could often be straightened with much difficulty, and the fingers uncurled. At times the case had to be abandoned, because of the requisition of too much force to make it worth while. The difficulty is also evidenced by finding that a later measurement of the same child shows a fraction of a centimeter less than before. This was a rare occurrence, but shows the unavoidable error in measuring small children.

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* From the Medical Service of the Children's Hospital.

† "Diseases of Infancy and Childhood"; 1913, page 21.

Only children with a normal appearance were measured. It was found upon grouping the various cases in preparation for their study that several were much below weight for their age. These were set aside and not considered in this series. As many of the infants and children were troubled with indigestion or pulmonary disorders, it is not to be wondered at that many had to be disregarded in this manner.

Table No. 1 represents all the cases arranged according to age. It is to be regretted that some ages are represented by but 1 or 2 cases, thus making too few for a fair average of their measurements. After the work was well along, they were selected with a view to filling in the blank spaces in the list. This method, although it gives no average for that age, at least makes a complete table, and allows the plotting of a complete curve, which is surprisingly regular in spite of this deficiency.

Beginning with the age of four years, the cases are arranged in groups of three months each, thus making four groups per year instead of twelve. The youngest child measured was 5 days of age, and none were taken on children who had reached their thirteenth birthday.

Boys and girls are arranged separately, but in all of the deductions presented below are grouped and averaged together. It is true that measurements of boys and girls are slightly different, but this difference is more one of interest than of practical value, and has been disregarded in this work. The curves which were prepared to compare the measurements of boys and girls will not be presented here. In Table No. 1 the boys are labelled M and the girls F.

All of the measurements are recorded in centimeters. The weight is always in pounds and fractions of a pound.

All of the infants were weighed without clothing. With rare exceptions, the older children were weighed dressed. Between the ages of fifteen months and thirty months some were dressed and others undressed. This should be borne in mind in studying the table and charts which follow. A few were not weighed in the hospital or office, but the parent seemed sufficiently sure of the child's weight to have it go on record. No weights were estimated, and if it was not obtainable, it has been left out. This accounts for the occasional blank space in the weight column.

The circumference of the head appears in the fourth line of Table 1. It represents the greatest circumference obtainable. In older girls it was found that heavy hair interfered somewhat with accuracy. The hair was brushed aside as much as possible, but in spite of this the measurement was perhaps two- or three-tenths of a centimeter too long.

The anteroposterior measurement of the head is found in column 5 of the table. It represents the distance along the scalp in the mid-line from the lowest point of the glabella just above the bridge of the nose, to the lowest portion of the external occipital protuberance. There again the long hair and braids of the older girls interfered somewhat with accurate measuring.

The chest was measured at the level of the nipples, and a point midway between inspiration and expiration selected for the reading. The measurement was always made next to the skin. Older girls with developing breasts were not measured. The chest measurements appear in column 6 of the table.

The height was measured by placing the child upon a long table, the head at one end. A board was then placed at the child's head, and the child so arranged that the top of the head just touched the board. This brought the top of the head at the table's edge. A board was then placed at the child's feet and the toes elevated so that the total height of the child was represented by the distance from the end of the table to the board at the child's feet. This distance was then measured. The shoes were always previously removed. In infants and fussy children, the knees had to be forcibly straightened. This rendered the task difficult, and it was repeated two or three times to insure accuracy. The heights of the cases in the series are found in column 7 of the table.

The leg was measured from the lowest point of the anterior superior spine of the ilium to the bottom of the foot. The feet were always bared. The toes were held straight up as in measuring the height. The lower reading was taken at the level of the instep. This measurement represents what it would be if the child were standing, and was measured from the anterior superior spine to the floor at the instep. A few of the older children were actually measured in this way; the height being measured by placing a horizontal on the head, and the distance to the floor measured on a board attached to the wall. The leg measurements are found in column 8 of the table.

The arm was measured by placing a broad piece of splint wood well up into the axilla; and the tip of the middle finger marked off upon the board with a pencil or the finger nail. The splint wood was always placed snugly into the axilla as far as it would go without causing discomfort. The elbow was straightened as much as possible, and the fingers extended. This process requires considerable force in infants and fussy children. The clothing was always removed for this measurement. The figures for the length of the arm are found in column 9 of the table.

The tenth column represents the percentage of length of leg to the total height. This is found by dividing the average length of legs by the average total height in each instance. In the eleventh column is found the corresponding percentage of length of arm to total height.

The last column gives the number of individual cases for each month and sex. Their sum total represents all the children considered in this series.

TABLE NO. I

Age	Sex	Weight	Head Circum.	Head Ant. Post.	Circum. Chest	Length	Leg	Arm	Leg Height	Arm Height	Cases
		Lbs.	c.m.	c.m.	c.m.	c.m.	c.m.	c.m.	%	%	
Birth	M	8.31	36.4	22.8	33.7	52.8	22.3	18.2	42.5	34.9	2
	F	6.64	34.8	20.7	30.6	51.2	21.7	17.6	42.3	34.3	2
1 m.	M	7.75	37.0	21.9	31.3	53.4	22.5	18.8	42.1	35.2	2
	F	7.06	37.1	22.0	31.8	50.2	22.0	17.1	[illegible]	34.0	1
2 m.	M	8.92	38.6	24.4	35.7	53.6	23.1	18.6	43.0	34.7	4
	F	7.56	37.1	22.7	33.5	54.5	23.4	19.6	42.9	35.9	5
3 m.	M	9.42	38.7	24.3	35.7	57.4	24.2	19.2	42.1	33.4	3
	F	9.62	38.4	23.8	35.3	56.0	24.3	19.5	43.4	34.8	4
4 m.	M	9.46	39.1	24.5	35.4	57.5	24.4	19.8	42.4	34.4	3
	F	11.06	39.9	24.8	36.1	57.4	24.6	20.5	42.8	35.7	2
5 m.	M	11.69	41.5	26.3	38.2	61.3	26.4	21.2	43.0	34.5	3
	F	14.88	41.6	26.4	39.3	64.9	30.8	21.6	47.4	33.2	2
6 m.	M	16.31	44.0	27.7	42.0	66.9	29.5	22.7	44.1	33.9	5
	F	16.09	42.0	26.7	41.4	65.7	28.3	22.5	43.0	[illegible]	4
7 m.	M	17.75	44.3	27.5	43.3	69.8	32.7	23.5	46.8	33.6	3
	F	14.95	42.0	25.2	39.6	64.2	29.2	22.7	45.4	35.3	3
8 m.	M	16.65	44.2	27.2	42.6	65.9	30.3	22.7	45.9	34.4	4
	F	17.12	43.7	27.3	42.7	66.5	31.4	22.6	47.2	33.9	4
9 m.	M	17.06	43.3	27.5	40.3	66.5	30.1	23.2	45.2	34.8	3
	F	16.69	43.3	27.0	44.6	69.8	32.7	24.1	46.8	34.5	4

Age	Sex	Weight	Head Circum.	Head Ant. Post.	Circum. Chest	Length	Leg	Arm	Leg Height	Arm Height	Cases
		Lbs.	c.m.	c.m.	c.m.	c.m.	c.m.	c.m.	%	%	
10 m.	M	16.71	44.9	28.8	42.1	67.5	30.1	23.4	44.5	34.6	2
	F	20.0	46.0	28.1	44.0	71.6	32.3	25.4	45.1	35.4	1
11 m.	M	18.10	44.0	27.4	42.6	72.6	33.4	25.2	46.0	34.7	2
	F	19.06	46.4	29.4	44.5	72.5	32.3	24.4	44.5	33.6	1
1 yr.	M	20.12	43.2	26.8	42.8	75.2	35.1	26.9	46.6	35.8	1
	F	19.0	49.2	28.5	42.6	73.0	33.0	25.5	45.2	34.8	1
1 1-12	M	19.88	45.8	28.2	44.1	75.9	34.4	26.3	45.3	34.6	2
yrs.	F	18.47	44.8	28.3	43.7	73.6	33.5	25.3	45.5	34.4	3
1 2-12	M	20.38	47.8	29.7	44.5	72.5	33.8	26.5	46.6	36.5	1
yrs.	F	21.03	45.0	29.0	44.9	73.9	34.1	26.0	46.1	35.2	2
1 3-12	M	20.06	46.8	29.2	44.3	71.7	33.0	22.9	46.0	36.1	4
yrs.	F	18.0	44.8	28.4	44.1	73.6	32.9	25.8	44.7	35.0	1
1 4-12	M	23.59	46.7	28.2	46.7	78.9	36.9	28.9	46.7	36.6	2
yrs.	F	21.50	43.2	28.2	46.8	75.2	36.5	27.6	48.5	36.7	1
1 5-12	M	21.92	46.6	29.9	46.2	78.3	35.5	27.8	45.3	35.5	3
yrs.	F	......	45.2	29.1	44.6	74.2	35.8	28.7	48.2	38.6	1
1 6-12	M	25.0	48.5	30.0	46.4	81.3	36.7	28.8	45.1	35.4	1
yrs.	F	23.0	45.4	31.4	45.5	83.7	39.5	31.2	47.2	37.2	1
1 7-12	M	20.06	47.6	29.6	42.8	76.2	34.5	27.0	45.2	35.4	1
yrs.	F	23.25	47.2	29.8	45.2	80.1	36.8	27.7	45.9	34.5	2
1 8-12	M	24.58	46.9	29.4	47.3	82.5	38.2	29.2	46.3	35.4	3
yrs.	F	25.50	46.0	29.5	47.7	85.9	40.5	32.0	47.1	37.2	1
1 9-12	M	23.87	47.9	31.1	48.2	77.0	35.8	28.1	46.5	36.5	2
yrs.	F	22.0	48.4	31.3	43.9	80.3	37.6	28 1	46.8	34.9	2
1 10-12	M	26.62	48.3	29.9	47.3	86.3	38.9	29.6	45.0	34.3	2
yrs.	F	27.0	48.5	30.5	48.6	84.1	39.8	29.4	47.3	34.2	2
1 11-12	M	29.81	49.2	30.7	51.1	84.1	40.5	29.9	48.1	35.5	3
yrs.	F	24.50	48.4	30.7	49.0	79.2	38.2	28.9	48.2	36.4	1
2 yrs.	M	26.0	47.1	28.6	47.8	85.5	40.4	30.6	46.0	35.7	2
	F	27.2	48.1	30.6	49.1	86.0	40.2	30.2	46.8	35.1	2
2 1-12	M	27.3	47.6	31.2	49.6	86.7	41.4	31.0	47.7	35.7	3
yrs.	F	27.0	48.3	31.1	49.3	86.0	41.0	30.8	47.6	35.8	1
2 2-12	M	27.4	49.2	31.6	49.1	86.8	42.6	31.8	49.0	36.6	2
yrs.	F	24.5	47.7	30.2	45.0	83.8	40.0	30.1	47.7	35.9	1
2 3-12	M	25.7	48.1	30.9	47.2	85.5	41.2	31.3	48.1	36.6	2
yrs.	F	24.0	46.8	29.8	44.9	86.1	41.8	30.4	48.5	35.3	1
2 4-12	M	27.5	48.2	30.9	47.2	86.5	41.4	30.4	47.8	34.4	2
yrs.	F	28.0	47.0	30.9	50.1	89.8	44.2	32.3	49.2	35.9	2
2 5-12	M	30.2	48.1	29.5	49.2	90.2	44.7	32.0	49.5	35.4	1
yrs.	F	28.5	47.2	29.3	46.3	88.4	42.8	30.8	48.4	34.8	1
2 6-12	M	29.2	49.3	31.3	50.0	92.7	44.9	32.4	48.4	34.9	2
yrs.	F	28.0	49.0	31.0	50.4	87.3	42.3	31.3	48.4	35.8	1
2 7-12	M	31.6	48.8	31.5	51.3	89.0	42.7	32.8	47.9	36.8	4
yrs.	F	25.0	48.8	31.5	51.2	87.1	41.2	30.0	47.3	34.4	1
2 8-12	M	29.0	48.9	31.6	51.4	87.8	43.8	32.6	49.8	37.1	1
yrs.	F	28.0	48.7	33.4	47.7	85.9	44.3	32.6	51.5	37.9	1
2 9-12	M	28.0	48.5	30.9	50.8	92.8	45.2	34.8	48.7	37.5	1
yrs.	F	29.0	49.2	31.3	51.2	92.2	44.8	33.3	48.5	36.1	1
2 10-12	M	32.3	50.2	31.7	52.1	91.5	45.6	34.0	49.8	37.1	2
yrs.	F	32.0	47.8	30.7	49.1	92.5	45.1	34.5	48.7	27.3	1
2 11-12	M	34.0	51.6	32.8	52.3	91.8	44.6	32.9	48.5	35.8	1
yrs.	F	31.0	50.2	30.5	50.1	91.4	45.1	33.2	49.3	36.3	1
3 yrs.	M	32.3	50.4	30.6	50.8	91.8	46.2	34.2	50.3	37.2	2
	F	34.0	51.2	32.4	52.3	91.2	45.9	32.8	50.3	35.9	1
3 1-12	M	......	50.6	32.2	53.7	93.3	47.0	33.0	50.3	35.3	1
yrs.	F	33.5	51.1	31.9	51.8	91.2	44.8	33.2	49.1	36 4	1
3 2-12	M	33.4	48.8	31.2	51.6	92.3	46.2	34.1	50.0	36.9	1
yrs.	F	30.0	48.9	30.8	48.1	91.3	46.0	32.9	50.3	33.0	2
3 3-12	M	31.4	49.7	31.9	51.0	92.9	47.5	35.5	50.2	38.2	3
yrs.	F	30.5	48.0	29.6	48.7	91.8	44.3	34.2	48.2	37.2	2
3 4-12	M	......	50.6	30.7	51.7	101.5	51.4	39.0	50.6	38.4	1
yrs.	F	30.5	47.1	28.2	50.1	92.4	47.6	35.8	51.5	38.7	2
3 5-12	M	32.2	49.9	32.1	52.1	100.4	50.9	37.0	50.6	36.8	3
yrs.	F	34.0	51.2	33.7	51.8	100.2	51.1	36.3	50.9	36.2	1
3 6-12	M	35.0	51.0	33.9	50.0	97.6	51.3	35.4	51.5	36.2	1
yrs.	F	29.0	47.7	30.0	48.7	94.7	47.3	35.0	49.9	36.9	2
3 7-12	M	34.0	49.9	33.6	49.7	97.4	51.1	35.1	51.4	36.0	1
yrs.	F	32.2	48.6	31.6	49.4	98.5	50.9	35.7	51.6	36.2	2
3 8-12	M	31.5	49.8	31.3	51.7	99.8	49.3	36.6	49.4	36.6	5
yrs.	F	36.0	50.6	32.4	53.1	101.2	52.8	36.1	52.1	35.1	1
3 9-12	M	37.0	50.4	32.5	55.9	96.0	49.0	34.9	51.0	36.3	1
yrs.	F	34 0	51.1	33.4	50.1	101.6	53.3	36.7	52.4	36.1	2
3 10-12	M	33.5	50 1	31.1	52.3	98.5	50.8	36.4	51.5	36.9	2
yrs.	F	31.0	50.2	31.8	52.2	100.0	49.2	35.7	49.2	35.7	3

Age	Sex	Weight	Head Circum.	Head Ant. Post.	Circum. Chest	Length	Leg	Arm	Leg Height	Arm Height	Cases
		Lbs.	c.m.	c.m.	c.m.	c.m.	c.m.	c.m.	%	%	
3 11-12	M	34.0	50.0	32.3	51.6	98.3	48.7	35.8	49.5	35.4	2
yrs.	F	36.2	50.1	31.0	51.1	99.3	49.7	35.7	50.0	35.9	2
4 yrs	M	36.5	50.9	32.6	53.9	101.2	52.1	38.7	51.4	38.2	5
	F	31.7	48.1	29.9	48.9	92.7	47.2	33.6	50.9	36.2	2
4 3-12	M	34.2	50.5	31.5	51.5	100.8	51.3	36.9	50.9	36.6	5
yrs.	F	34.5	48.4	31.4	49.6	101.6	51.6	37.0	50.8	36.4	3
4 6-12	M	36.5	49.2	32.1	50.5	101.1	51.2	37.3	50.6	36.8	3
yrs.	F	34.6	49.0	32.3	49.4	101.5	52.7	37.5	51.9	36.9	3
4 9-12	M	39.3	49.0	31.6	49.9	99.3	50.4	38.0	50.7	38.2	2
yrs.	F	37.8	48.8	32.4	50.8	101.9	52.9	38.0	51.9	37.2	2
5 yrs.	M	41.7	51.0	30.7	52.5	106.2	55.1	39.6	51.8	37.3	2
yrs.	F	39.8	49.7	31.7	52.5	105.8	57.7	39.7	54.5	37.5	4
5 3-12	M	47.1	51.3	33.0	53.0	109.4	57.8	41.2	52.8	37.6	4
yrs.	F	42.5	50.0	32.6	51.1	109.0	59.3	42.2	54.4	38.7	2
5 6-12	M	40.5	50.3	31.9	54.5	108.1	56.9	41.0	52.6	37.9	7
yrs.	F	39.5	49.7	31.4	53.6	107.3	55.9	40.5	52.1	37.7	4
5 9-12	M	44.0	53.2	33.8	54.1	111.1	58.5	42.0	52.6	37.8	2
yrs.	F	44.8	50.3	31.7	55.5	113.9	61.3	43.2	53.8	37.9	3
6 yrs.	M	48.0	52.3	33.1	56.3	114.3	60.1	43.2	52.5	37.7	5
	F	41.9	50.0	31.7	53.0	110.1	58.5	41.3	53.1	37.5	5
6 3-12	M	49.5	53.4	34.0	58.6	116.1	63.7	46.8	54.8	40.3	1
yrs.	F	42.3	50.4	31.0	53.9	107.4	56.4	40.9	52.5	37.9	3
6 6-12	M	48.1	51.4	32.3	54.2	115.9	62.7	45.2	54.0	39.0	4
yrs.	F	47.6	51.7	32.7	54.3	117.1	62.0	44.1	52.9	37.6	2
6 9-12	M	47.5	52.0	33.2	55.7	117.2	63.2	44.9	53.9	38.3	5
yrs.	F	46.7	50.5	31.2	54.8	114.6	60.1	43.2	52.4	37.6	7
7 yrs.	M	49.3	51.9	32.1	57.5	119.6	64.9	46.8	54.1	39.1	5
	F	47.2	51.1	31.6	56.2	116.0	62.8	44.7	54.1	38.5	4
7 3-12	F	47.3	51.1	32.4	57.4	117.7	63.0	45.3	53.5	38.4	7
yrs.	M	45.1	49.8	31.5	54.0	115.7	62.3	44.1	53.8	38.1	4
7 6-12	M	51.1	52.1	32.5	59.2	121.0	64.8	46.3	53.5	38.2	5
yrs.	F	49.5	52.9	35.3	54.7	126.8	69.0	44.7	54.4	35.2	1
7 9-12	M	51.8	50.0	30.9	55.2	117.6	62.6	45.2	53.2	38.4	2
yrs.	F	48.1	51.3	32.2	56.4	114.8	61.2	44.5	53.3	38.7	3
8 yrs.	M	53.5	51.4	32.8	56.8	121.9	66.7	47.7	54.7	39.1	2
	F	53.3	52.1	31.7	56.2	121.6	64.4	45.3	52.9	37.2	3
8 3-12	M	......	50.1	30.1	56.7	116.4	61.2	45.4	52.5	39.0	1
yrs.	F	55.0	51.3	31.0	58.0	126.4	67.7	46.9	53.5	37.1	2
8 6-12	M	54.8	52.5	33.1	60.7	128.4	74.9	47.8	58.3	37.2	4
yrs.	F	53.3	51.1	31.9	60.8	122.4	66.3	46.2	54.1	37.7	3
8 9-12	M	56.6	51.8	32.3	60.2	124.6	67.1	47.1	53.8	37.8	3
yrs.	F	52.8	51.5	30.7	57.1	121.4	62.8	46.5	51.7	38.3	2
9 yrs.	M	65.5	51.9	33.1	59.8	125.9	67.6	47.9	53.6	38.0	2
	F	56.6	51.4	32.7	58.2	123.3	67.1	46.7	54.4	37.8	3
9 3-12	M	56.3	51.6	32.5	57.8	127.2	69.5	49.1	54.6	38.6	6
yrs.	F	61.1	50.1	32.3	61.5	129.8	71.2	50.9	54.8	39.2	4
9 6-12	M	63.3	52.3	33.0	60.9	127.1	70.1	49.1	55.1	38.6	5
yrs.	F	56.7	51.4	31.9	57.4	130.7	72.7	51.2	55.6	38.4	8
9 9-12	M	66.7	52.7	33.0	61.3	132.5	73.3	52.8	55.3	39.8	5
yrs.	F	67.0	52.0	32.5	60.2	134.7	74.7	49.5	55.4	36.7	3
10 yrs.	M	67.9	53.6	33.5	61.5	134.3	74.6	52.9	55.5	38.8	3
	F	61.0	52.7	32.2	62.4	129.5	72.3	49.7	55.8	38.3	3
10 3-12	M	69.2	53.8	34.4	63.5	134.1	74.1	53.2	55.2	39.6	4
yrs.	F	66.6	53.4	33.7	62.9	135.7	75.9	52.8	55.9	38.8	4
10 6-12	M	68.7	54.0	34.4	63.5	136.4	77.2	54.4	56.5	39.8	3
yrs.	F	66.1	53.7	33.6	62.1	135.8	76.4	52.7	56.2	38.8	4
10 9-12	M	72.0	54.1	34.3	65.1	136.8	74.9	55.8	54.7	40.7	3
yrs.	F	67.3	50.7	29.7	61.2	130.1	71.4	49.3	54.8	37.8	2
11 yrs.	M	74.5	54.1	33.8	65.8	141.3	78.8	57.2	55.7	40.4	3
	F	66.5	52.3	31.7	62.5	138.8	77.2	53.1	56.3	38.2	3
11 3-12	M	73.8	53.1	32.7	66.2	137.8	76.4	55.3	55.4	40.1	3
yrs.	F	73.0	53.7	32.8	66.4	139.3	77.2	54.1	55.4	38.8	1
11 6-12	M	75.9	53.8	33.4	67.7	143.6	81.5	57.9	56.7	40.3	3
yrs.	F	79.3	53.2	33.2	66.1	142.6	82.4	57.2	57.7	40.1	3
11 9-12	M	80.2	53.7	33.8	66.9	140.9	77.9	55.8	55.2	38.1	3
yrs.	F	77.2	53.1	32.6	66.1	140.2	77.3	55.2	55.1	39.3	4
12 yrs.	M	80.8	54.1	33.1	66.8	142.0	80.5	56.9	56.6	40.0	5
	F	81.2	53.6	33.1	66.2	144.2	82.4	58.5	57.1	40.5	7
12 3-12	M	84.8	53.7	34.1	65.5	142.9	79.5	58.4	55.6	40.8	3
yrs.	F	84.2	52.5	32.8	65.6	144.0	81.3	58.6	56.4	40.6	4
12 6-12	M	92.0	54.9	34.3	70.0	148.5	84.8	58.8	57.1	39.5	1
yrs.	F										
12 9-12	M	89.2	55.0	34.2	70.0	147.5	83.7	59.5	56.7	40.3	2
yrs.	F	92.0	54.3	33.9	71.4	148.5	85.0	59.1	57.2	39.8	1

Many investigators have compiled tables of weights and heights, and circumferences of chest and head. Almost every text-book of pediatrics has such a table. It is found upon comparing them that they agree in certain measurements and differ—sometimes widely—in others. For the most part, the measurements of the head and chest are alike in all the tables and compare favorably with Table 1 here. No two series of weights and heights are alike however. They diverge greatly from six to thirteen years. The weights and lengths in this table are a little below the average found by other investigators up to two years, and a little more than the average from seven to thirteen years. Taking the table as a whole, it corresponds most closely to Boas's tables found in several text-books.

Comparisons of the circumferences of the head and chest have been made many times before, because of its value in diagnosing microcephalus, hydrocephalus, etc. The result of this series may be of interest. Chart No. 1 shows the curves of the circumferences of the head and chest, arranged according to increase in age. It is to be noted that the circumference of the head is always larger than that of the chest up to the age of one year and four months. After the age of two years and four

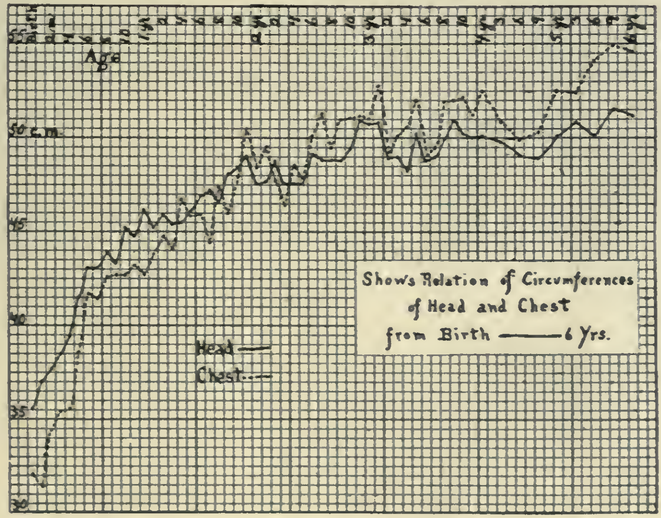

Fig. 1

months the circumference of the chest is always more than that of the head. Individual cases, although apparently normal mentally and physically, do not always follow this rule. A child in this series shows the circumference of the chest larger than that of the head at the age of three months. On the other hand, the head was found larger than the chest at as great an age as five years and five months.

As a matter of interest, all the cases of the series were arranged according to weight, and the average circumference of the head and chest struck for each group. Each group contains all the cases in the series weighing the same number of pounds, the ounces being disregarded. Chart No. 2 shows the curves plotted from these averages. It is to be noted that the head is larger than the chest up to 21 pounds. Beginning with 25 pounds the chest is always larger in circumference than the head. Individual cases, however, do not always follow this rule, as one case in the series shows the chest larger than the head at 14 pounds and another shows the head larger than the chest at 45 pounds.

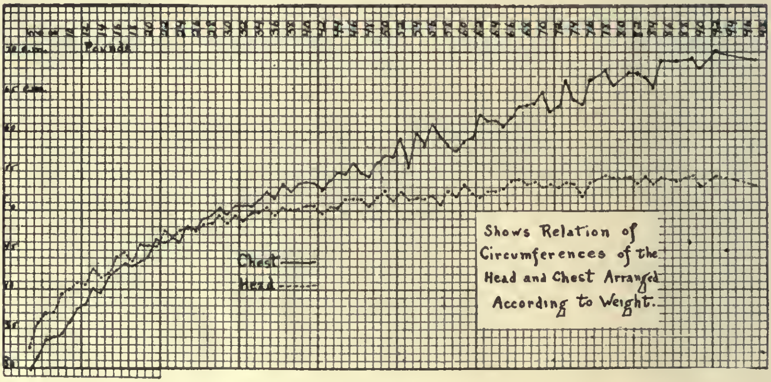

Fig. 2

The curves in Chart 2 are much more regular than in Chart 1. As a matter of interest, it will be noticed that Chart 2 extends from 5 to 97 pounds, *i.e.*, 93 groups of cases. Only 4 of these groups, or 4.3 per cent. of the whole series, is contained in the section in which the two curves cross. Chart 1 would contain 84 groups of cases if continued to 13 years. In this chart, 13 groups, or 15.4 per cent. of the whole series, falls within the section in which the curves cross. Even considering the first and last individual cases to cross each other, the sections of the charts included within these intersections would be 61.9 per cent. of Chart 1, and only 34.4 per cent. of Chart 2. It would seem conclusive, therefore, that the circumferences of the head and chest bear a much more regular relation to the weight of a child than to its age.

Another chart not presented here was made showing the relation of height to weight. The curve of heights was much more irregular than that of the chest in Chart 2, and shows how much more the weight varies with circumference of the chest than with the height. In other words, plumpness and weight bear more relation to each other than to height and weight.

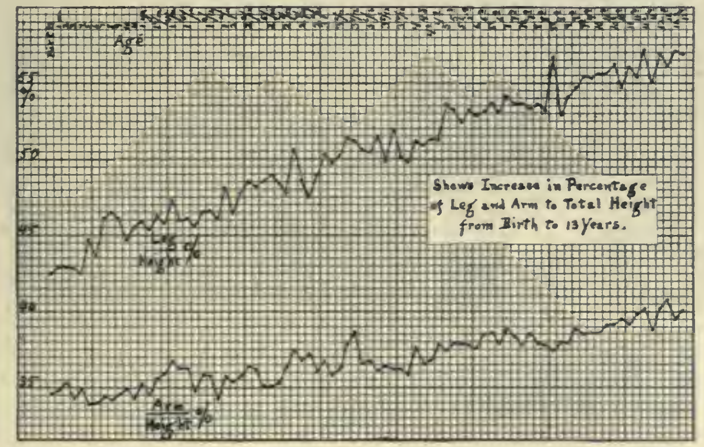

Fig. 3

Chart No. 3 shows the increase in percentage of the length of the arm and leg to the total height, arranged according to age. Holt's figures show a similar percentage of the length of leg to height at birth, *i.e.,* about 43 per cent. At five years his figures show the leg 54 per cent. of the height. In this series 54 per cent. is not reached until the seventh year.

Chart No. 4 shows the increase in the length of the leg and arm arranged according to the increasing height of the cases. It is to be noted how much more regular the curves are in Chart

4 than in Chart 3. The difference depends upon the fact that the greater the height of the individual case, the greater is the percentage of the length of the leg and the arm to the height and *vice versa*. As some individuals at a certain age are tall and others short, the curve of percentages is bound to be irregular. It is to be observed in Chart 4, however, that when the cases are arranged according to height, the absolute length of the leg and arm gradually increases in almost a straight line.

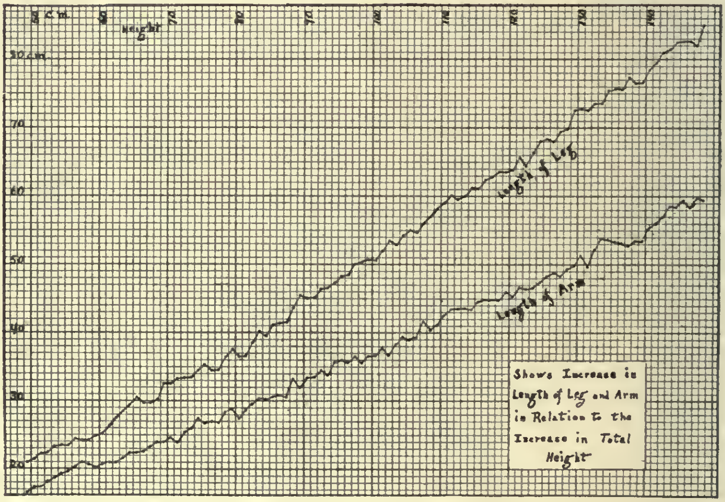

Fig. 4

Upon closer observation of the curves in Chart 4 it will be seen that—

(1) As regards the leg, the curve advances regularly from the shortest height observed—49 cm. to 80 cm. The length of the leg is 36.6 cm. at this point. It may be calculated from these figures that for each gain of 1 cm. in height up to 80 cm. in height the leg gains on an average of .503 cm. At the height of 80 cm. the leg measures 36.6 cm. In order to calculate the average length of the leg for a given height under 80 cm. one must subtract from 36.6 cm. .503 cm. for each 1 cm. of height under 80 cm. For example, to calculate the average length of leg in a child which measures 62 cm. in height, subtract 62 from 80, *i.e.*, the height of the child is 18 cm. shorter than the case we use

as a starting point. For each 1 cm. of height the leg gains .503 cm. 18 × .503 = 9.0 cm. Subtracting this from 36.6 we have 27.6 cm.—the average length of leg required. It will be noticed that a point placed at 27.6 cm. at the height of 62 cm. will be intersected by a line drawn from the point representing the shortest length of the leg, 21 cm. (height, 49 cm.) to that representing the length of the leg, 36.6 cm. (at height 80 cm.).

(2) Beyond the height of 80 cm. the curve representing the length of the leg advances by regular steps. For each gain of 1 cm. in height the leg gains .712 cm. in length.

To calculate the average length of leg for a case over 80 cm. in height, .712 cm. must be added to 36.6 for every 1 cm. of height over 80 cm.

For example, to find the average length of leg for a child 121 cm. in height, subtract 80 cm. from 121 cm.; that is, the child is 41 cm. taller than our starting point of 80. For each 1 cm. of height the leg increases .712 cm. 41 × .712 = 29.1 cm. Adding this to our starting point of 36.6 cm. we have 65.7 cm., the average length of leg for the height 121 cm. This point will fall exactly on a line drawn from 36.6 (at height 80) to 85 (height 148) on Chart 4.

(3) As regards the arm, the curve advances regularly to a length of 32 cm. at height 90 cm. Beyond this point it again advances regularly to the end of the chart. It has been deduced that for each gain of 1 cm. in height up to 90 cm. the arm gains on an average of .373 cm. Beyond this point to the end of the chart it gains .470 cm. for each 1 cm. gain in height. To calculate the average length of arm for a child of given height, first find how many cm. the height of the child is above or below 90 cm.—the starting point. For each 1 cm. above 90, .470 cm. must be added to 32.0 cm. at the starting point. For each 1 cm. of height below 90, .373 cm. must be subtracted from 32.0 cm.

For example, to calculate the average length of arm for a child measuring 61 cm. in height, subtract 61 from 90. This shows that the case is 29 cm. shorter than 90—the starting point. Now for each of these 29 cm., .373 cm. must be subtracted from 32.0 cm. 29 × .373 = 10.8 cm. Subtracting this from 32 cm. we have 21.2 cm., or the average length of arm for a child 61 cm. in height. It will be found that this point will fall exactly on a line drawn from 16.7 (height, 49 cm.) to 32 (height, 90 cm.).

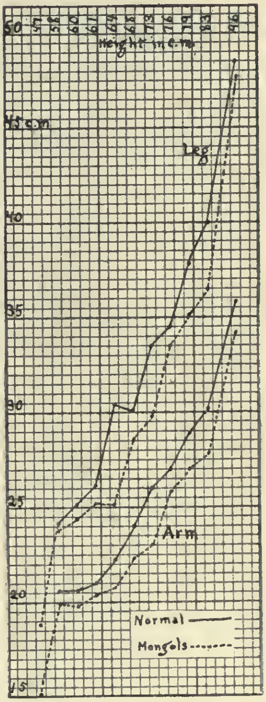

Fig. 5 shows shortness of arms and legs in relation to total height in 15 cases of Mongolian idiots

(4) From the height of 80 cm. on, the length of leg increases 41 per cent. faster than before this point. Likewise from the height of 90 cm. the arm increases 25 per cent. faster than up to this point.

While carrying out this work in measurements, several cases of Mongolian idiots and 2 cases of cretinism were encountered. These are presented here only to show practicable possibilities in the use of the curves of normal measurements. Chart No. 5 shows a comparison of the length of the legs and arms in relation to the height, of a series of 15 Mongolian idiots, compared with the normal lengths at these same heights. It will be observed that the arms and legs are consistently shorter. One case was shorter in height than any case in the normal series. No normal point, therefore, is offered for comparison.

Chart No. 6 shows the relation of percentages of the length of the leg and arm to the height, arranged according to age, in the same series of Mongolian idiots—compared with the normal curve at the same ages. It will be observed that with but one exception (in the arm) the percentages are smaller in the Mongolian idiots than in the normal.

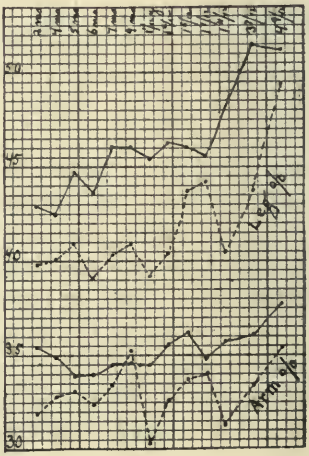

Fig 6 shows comparison of percentages of arm and leg to total height of 15 cases of Mongolianism with the normal. Broken line=Mongols

Charts No. 7 and 8 were plotted from a case of cretinism named "Sherry." The case was seen and diagnosed at the age of six months, and received thyroid from the start.

It improved continually and was measured about every month. Chart No. 7 shows the increase of the length of leg and arm in relation to height compared with the normal curve for those heights. Chart No. 8 shows the increase in percentages of the length of arm and leg to the height arranged according to age—compared with the normal chart at those ages.

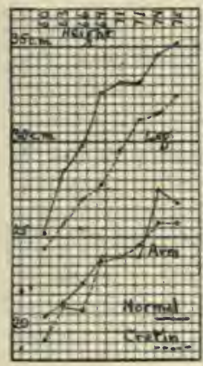

Fig. 7

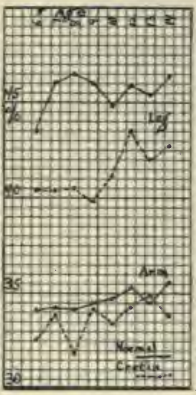

Fig. 8

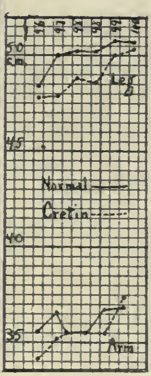

Fig. 9

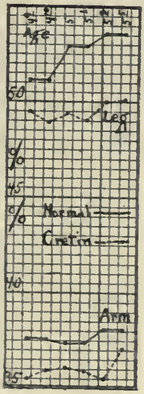

Fig. 10

Fig. 7. Shows growth of leg and arm in relation to height in cretin "Sherry" as compared to normal

Fig. 8. Shows increase in percentage of leg and arm to height of cretin "Sherry" as compared to normal

Fig. 9. Shows growth of arm and leg in relation to height in cretin "Orphant" as compared to the normal

Fig. 10. Shows increase in percentage of arm and leg to height in cretin "Orphant" as compared to the normal

In Chart 7 it will be noticed that the length of the arm is a trifle shorter at the height of 66 than at 63. This is due to one of the unavoidable errors in measuring infants. It will be noted in both these charts that the arms are but slightly shortened, while the legs are markedly shorter than normal. This case is still being followed at the present writing and offers no further deductions at present.

Charts 9 and 10 show curves plotted from a cretin named "Orphant." This patient had been receiving thyroid since the age of one year, but was not measured until it was four years and nine months old. The child was then fairly normal mentally and could not be recognized as a cretin physically. The patient is still receiving thyroid and is measured about every two months.

Chart 9, however, shows the length of the leg definitely shorter than normal for the height.

The section of the normal curve for the length of the arm at this point is unfortunately very irregular and interferes with reasonable comparison. Chart No. 10 shows the curve of the percentage of the length of the leg and arm to the height definitely lower than the normal for the same ages.

These cases of Mongolian idiots and cretins are by far too few in number and have been followed for too short a time for any serious deduction, but nevertheless seem to show enough to warrant further work along these lines, both as a help in diagnosis and for general interest.

CONCLUSIONS

(1) Comparison of the circumferences of the head and chest are much more accurate in relation to weight than to age.

(2) The arms and legs grow in a definite relation to the increase in height. This growth bears more relation to the height than percentage of the height to the age.

(3) Age is a poorer basis for the comparison of any dimensions than is weight or height. Development and age are not constantly parallel.

272 Newbury Street.

BRONCHOGENEOUS, PLACENTOGENEOUS, DERMATOGENEOUS AND ENTEROGENEOUS INFECTION WITH TUBERCULOSIS IN INFANCY—C von Pirquet (Edinburgh Medical Journal, 1914, n. s. XIII., p. 220) says that for the first year of life the bronchogeneous infection with tuberculosis is by far the most frequent way of entry (about 95 per cent. of all infections). The enterogeneous infection is not important—at least not in Austria. (1 per cent. to 2 per cent. of all infections.) A placentogeneous infection of the fetus is a rarity, as is also stomatogeneous and dermatogeneous infections. Prophylaxis of infant tuberculosis has chiefly to deal with the separation of the nursling from the coughing adults.—*The American Journal of Obstetrics.*

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EDITORIAL

CONSTRUCTIVE SOCIAL MEASURES

A booklet with the above title has been issued by the New York Association for Improving the Condition of the Poor, describing the work done during the past two years by its Department of Social Welfare in administering the Milbank Fund. This fund, given to help “in fostering preventive and constructive social measures . . . as distinguished from relief measures,” has been productive of a great deal of social benefit in many ways. The story of this work illustrates how valuable it is that “charity,” so-called, shall not merely give relief to the immediate call of necessity, but shall contribute something to lessen that call through the years. The critics of organized charity, on the one hand, harp on the blessedness of immediate relief; the large philanthropists, on the other, find it hard to distribute much money without pauperizing the recipients. The social worker who is subsidized to investigate the causes of poverty, disease and distress, becomes a means for the ultimate relief of necessity and the avenue through which may be poured help which will not harm. In commerce there are "business doctors" who inquire into business methods and introduce efficiency into the business machine. So into the social fabric workers helped on by such funds as the Milbank Fund weave brighter and stronger threads of greater happiness and greater comfort.

The Association has coöperated with the Health Department in the medical inspection of school children, and by means of surveys of the work now being done has helped to lay out plans for even more effective work. Studies were made of the dental, nose and throat and eye defects so common among school children with the purpose of rendering efficient the control and the prevention as well as the care of these. A survey of school buildings was undertaken to attempt to formulate definite standards of excellence for their construction and to make easier the detection of defects which may be detrimental to the physical welfare of the school child.

One very interesting feature of this work has been the establishment and extension of the school lunch service. During the last school term there were served one and one half million portions of food. These are served at present at a slight loss, which is rapidly diminishing. The character of the food is carefully controlled and the lunch room in some instances has been utilized as an educational instrument, food talks being given, and exhibits arranged so that a better idea of food values and of what to eat may be spread abroad.

Not alone to the children in school is the instruction in food values given. By means of a Food Supply Store and a People's Kitchen, where foods are handled in a cleanly fashion and sold for a fair price, the general public is made aware of how food should be kept and prepared so that they demand better service and higher quality in their buying and avoid waste in the preparation of their food.

Further, surveys have been made to indicate better methods for lunch rooms, better dietaries for institutions; and to attempt to lower the cost of the distribution of food stuffs, at present in New York equalling 34 per cent. of the cost of food.

The efforts of this beneficent fund have extended to the public bathing facilities of the city; to the investigation of the laundry facilities of the poor; and to the increase of public comfort stations. One of the interesting studies from a medical point of view was that of the relation of flies to diarrheal diseases in infancy. This study, carefully and exhaustively pursued, resulted in a definite relationship being established between flies and diarrhea. A consideration of several factors was undertaken, namely, fly protection, condition of the home, type of feeding, age of child, and the nationality of the mother. Poorly protected homes, dirty homes, artificial feeding, all raised the morbidity rate tremendously, and the figures obtained showed conclusively to physician and layman alike three lines for attack in cutting down infant mortality.

An attempt is being made by the ventilation commission to determine the relative importance of various theories of ventilation, and the effect of certain so-called impurities in the atmosphere on comfort, appetite and ability to work. It is expected that reliable scientific standards will be evolved which will have practical application to workshop, school and home.

Such are a few of the activities made possible by intelligent giving, and the intelligent application of given funds.

THE MEDICAL LIBRARY ASSOCIATION

The Medical Library Association, now eighteen years old, carries on an unique work which should be more widely known and better appreciated. It is an experiment in altruism, a sort of "big brother movement," among medical libraries, for its object is to stimulate and foster the growth of medical libraries, and to maintain an exchange whereby the small, less amply endowed medical library may be helped by the larger, more bountifully supplied institution.

Both libraries and individuals who are interested in medical literature or libraries are eligible to membership and to the benefits of membership. At present, there are fifty-two library members and forty-six individual members, and the Association, through careful management, has done a great deal of good work and even acquired a surplus.

The newer small medical libraries throughout the country should be vitally interested in the work of the Association, interested enough all of them to become members. The benefits of membership are great to the small library, for it can, through the exchange, enlarge its number of volumes and complete its files of periodicals at little expense, and can obtain for its users, often, books which through other channels it might be impossible to obtain. The large medical libraries of the country are all affiliated with the Association and out of their abundance are glad to give. In 1914, 1,347 volumes and 2,023 miscellaneous pamphlets were distributed among forty libraries.

Individuals, too, can find in membership in the Association a means for getting what they need in their personal researches; and even if they are conveniently situated for access to a well-stocked medical library, the work of the Association is of interest to all who read medical literature and should be widely supported. The President of the Association now is Lieutenant-Colonel C. C. McCullough, Jr.; Library of the Surgeon-General's Office, Washington, D. C., and the Secretary-Treasurer is Dr. John Ruhräh, 1211 Cathedral Street, Baltimore, Md.

ORIGINAL COMMUNICATIONS

THE TRANSMISSION OF TUBERCULOSIS IN CHILDHOOD*

BY WILLIAM HALLOCK PARK, M.D.
New York City

Infection of Fetus During Intrauterine Life—Rollett, of Salzburg, reports the findings in an infant of two days. A general miliary tuberculosis was present. The mother died shortly afterward from miliary tuberculosis.

Harbitz, after an extended search, collected 20 cases of intrauterine infection in which the reports seemed reliable.

Intrauterine infection occurs therefore occasionally, but accounts for a very small proportion of the tuberculosis of childhood. In most of these cases the mother had extensive miliary tuberculosis.

Calmette and others believe there is no evidence that intrauterine infection ever proceeds from the father. This conclusion seems to me to be well founded.

A very large amount of information has been gathered on this subject from cattle. We know that the calves born of tuberculous cows are seldom infected when they are removed at the time of birth from their parents. These calves when fed afterward entirely on milk from uninfected cows, or which has been rendered safe from tuberculosis by heating, grow up to be healthy cows and do not react to tuberculin.

Infection During Infancy and Childhood—The human infant after birth is endangered not only by bacilli from human sources, but from diseased cattle. An enormous amount of investigation has definitely proven that both bovine and human types of tubercle bacilli are capable of infecting human beings from infancy through childhood. Dr. Krumwiede and I collected the cases of human tuberculosis tested for the type of infection. The relative importance of human and bovine infection at different ages is shown in the following table:—

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* Read before the Section on Pediatrics, New York Academy of Medicine, March 11, 1915.

COMBINED TABULATION OF CASES REPORTED AND OWN SERIES OF CASES*

Diagnosis	Adults 16 Years and Over		Children 5 to 16 Years		Children Under 5 Years	
	Human	Bovine	Human	Bovine	Human	Bovine
Pulmonary tuberculosis	778	3	14	—	35	1
Tuberculous adenitis, axillary or inguinal	3	—	4	—	2	—
Tuberculous adenitis, cervical	36	1	36	22	15	24
Abdominal tuberculosis	16	4	8	9	10	14
Generalized tuberculosis, alimentary origin	6	1	3	4	17	15
Generalized tuberculosis	29	—	5	1	74	7
Generalized tuberculosis, including meninges, alimentary origin	—	—	1	—	5	10
Generalized tuberculosis, including meninges	5	—	10	—	76	1
Tubercular meningitis	1	—	3	—	28	4
Tuberculosis of bones and joints	32	1	41	3	27	—
Genito-urinary tuberculosis	22	1	2	—	—	—
Tuberculosis of skin	10	3	4	6	2	—
Miscellaneous cases:						
Tuberculosis of tonsils	—	—	—	1	—	—
Tuberculosis of mouth and cervical nodes	—	1	—	—	—	—
Tuberculous sinus or abscess	2	—	—	—	—	—
Sepsis, latent bacilli	—	—	—	—	1	—
Totals	940	15	131	46	292	76

Mixed or double infections, 11 cases

TOTAL CASES—1,511, of which 478 were cases tested by us.

* Journal of Medical Research, Vol. XXVII., No. 1.

As is well known, cows only contaminate the milks extensively when they have disease of the udder. When lesions in this region are extensive many millions of tubercle bacilli may pass in each cubic centimeter of milk. Ordinarily, however, even in cases with moderate udder involvement, only a few hundred bacilli are present in a cubic centimeter. One or two cows with seriously diseased udders are capable of dangerously infecting the mixed milk of a whole herd.

As many of you remember, Dr. Hess found, in an investigation of the milk supply of New York City, undertaken several years ago, that 16 per cent. of the samples taken by him from the loose raw milk supply in the stores contained a sufficient bacilli in small amounts to cause tuberculosis in guinea-pigs after subcutaneous injection. A number of investigators have shown that even when the udder is apparently normal a few bacilli may be found in the milk. The infection may be due at times to undetected deposits, but at others it is due to bacilli in the manure which, with the dirt, reaches the milk. It is thought that sufficient bacilli may enter the milk in this indirect way from infected cows to cause danger to those that drink it. At present, the raw milk supply of New York City is small in amount and is entirely from tuberculin-tested herds, and these tests, which have been previously made annually, are now to be made semi-annually. If either annual or semi-annual tests are carried out carefully, and no infected cattle are brought into the herds, few or no tuberculous cattle will be present in the herds, and these will very seldom have any dangerous involvement.

During the past year a little less than 5 per cent. of the cows in the certified herds of Manhattan and Brooklyn have reacted and on autopsy only about ½ per cent. of these reacting cows have had more than a slight localized tuberculosis. None of these cows had any detectable udder tuberculosis. Quite a large number of samples of milk from these herds have been injected in guinea-pigs without causing any infection. Although it is impossible to state that the milk from the certified cows under present conditions is absolutely free of tubercle bacilli, still I think that they must be so few as to very rarely, if ever, cause infection. The only sure method of getting exact facts is to test out the type of bacilli in every infected infant or young child who is fed on raw milk. The Health Department Laboratories will be very glad indeed to test for the type of bacilli in any material submitted if the type of milk and other information needed is given. The farms producing Grade A raw milk, which are not certified, are probably supplying a milk nearly as free from tubercle bacilli as the certified milk. The supervision of these farms has not been as thorough as that of those certified.

The Effect of Pasteurization on Tubercle Bacilli—In literature, a certain number of experiments seem to indicate that tubercle bacilli in milk might survive a temperature of 140° for thirty minutes or over. Careful investigation has shown that the bacilli in these experiments could not have been exposed to the heat during this period. It was found that the method of testing allowed bacilli on the surface of milk to be exposed to a lower heat. Rosenau carried out a test with a commercial holder, but here the first milk passing into the apparatus was slightly chilled and not, therefore, really exposed to the full heat for the full time. It is fairly certain that where tubercle bacilli contained in milk are actually heated to 140°F. and held at that temperature for twenty minutes, they are destroyed. If any escape, they are too few to infect animals. Butter is known to contain tubercle bacilli when made from milk containing the same. In different samples of butter the bacilli remain for varying lengths of time. In one case they have been detected for as long as five months, but usually they die out within a few weeks. The evidence that butter actually transmits tuberculosis is less direct than in the case of milk. This is partly because the bacilli are less in number and partly because butter is not usually taken at an age when tuberculosis of the bovine type is most apt to be transmitted. Whether meat from tuberculous animals has ever transmitted tuberculosis to human beings is a question of some doubt. When the meat is thoroughly cooked, all the tubercle bacilli are certainly killed. When the meat is rare some may escape. As a matter of fact, the muscle of meat seldom contains appreciable numbers of bacilli.

Human Sources of Infection—Although recent investigations have definitely proved that bovine bacilli infect infants and to some extent older children, yet the evidence is equally clear that the majority of infections come from one human being to another. Calmette, reviewing statistics of the use of the von Pirquet reaction, shows that up to the age of one year positive results are given in 9 per cent., up to the age of two years 22 per cent., from two to five years 53 per cent., and from five to fifteen years 80 per cent. We see that while bovine infection is most prevalent in early childhood, the human infection increases in amount up to fifteen years of age.

It is interesting to note that, as in the case of many other diseases, infants as a rule possess a considerable insusceptibility to tuberculosis. The figures do not bear out Behring's suggestion uttered in 1903, that the origin of consumption is laid in infancy, remaining latent until something impairs resistance. Nor does our present knowledge agree with his belief that the original tubercle bacilli were usually of bovine type. In the case of infants and young children, the greatest danger lies in being attended by a tuberculous mother or nurse. The more we study the transmission of disease the more the direct transmission of pathogenic bacteria from the carrier becomes evident. The infant or child may receive tubercle bacilli from the hands, the lips, or other portions of the person of the nurse and swallow them and so cause an infection of the tissues of the throat or intestines. The neighboring glands become enlarged and the processes in the small infant remain local or become generalized. In other cases, the fine spray from the sneezing, coughing or loud speaking of the tuberculous attendant is inhaled by the infant. Some of these bacilli are caught on the nasal or pharyngeal mucous membrane and later swallowed. Others pass through the larynx and enter the bronchi and cause direct infection of the lung tissues. Tubercle bacilli, when the infected attendants are not careful, may be carried by the air on account of the breaking up of the dried sputum carelessly expectorated or freed from handkerchiefs. The avoidance of this direct human contamination can probably only be thoroughly maintained by the entire removal of the infant or child from contact with tuberculous persons. The danger can, however, be greatly lessened if all possible precautions are taken, but probably these can never be so thorough as to eliminate danger. In some investigations that we carried out, we found to a striking degree that the children of tuberculous parents were more infected with clinical tuberculosis than those living in families where no tuberculosis existed. This is in accord with the results obtained by many. The interesting question as to whether the infection producing the later manifestations takes place in adults or is the development of the earlier infection has not yet been decided. It is undoubtedly true that in regions where tuberculosis is abundant, a large percentage of infants and young children become infected. It is also true that in localities where tuberculosis does not exist that adults as well as children become directly infected. If, therefore, in this country adults do not become infected it must be because they have developed and retained immunity through having an earlier infection or because they are naturally immune. We are certainly not yet in a position to be willing to subject children to infection with tubercle bacilli of either the human or bovine type, in order that they may have conferred on them a partial immunity. This most interesting question of whether there is any way of immunizing to safely protect from later serious infection will undoubtedly be subjected to much study in the next few years.

THE CARE OF THE TUBERCULOUS CHILD*

BY I. OGDEN WOODRUFF, M.D.

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That we have such a title this evening shows the change in our ideas of tuberculosis in childhood in the last ten or fifteen years. A decade or more ago, aside from glandular and orthopedic manifestations of the disease, tuberculosis in childhood was looked upon as a disease seen but little outside of hospitals, where it presented itself as a grave disorder, and one in which any discussion of treatment was of a value more academic than practical, and in which the chief interest centered in the difficulties of diagnosis, the clinical course and the pathological findings. Incipient tuberculosis of the lungs was not described, and writers on pediatrics described the course of pulmonary disease as uniformly bad.

The discoveries of the local diagnostic reactions of Calmette and von Pirquet, particularly the latter, turned medical attention anew to the study of tuberculous infection in early life; and the International Congress in Washington in 1908, coming at a time when these tests were becoming more widely employed, gave a fresh interest in this country to the study of the problems, both diagnostic and therapeutic, which were presenting themselves. It is probably to the organized work against tuberculosis, particularly the municipal crusades against the disease that we owe the opportunity to examine large numbers of children exposed to tuberculosis, and thereby to realize not only the prevalence of infection in early life, but also the frequency of early pulmonary manifestations.

It is more with the care of early and hopeful types of the disease in its various forms and particularly with the consideration of prophylactic measures, that I propose to concern myself and the scope of this paper does not include the care of advanced or generalized cases, beyond pointing out in passing that for such cases, if "open," segregation is as important as in the adult.

While what I have to say will apply equally well to advanced cases (and in many instances life may be prolonged for considerable periods in cases which before proper remedial measures are instituted seem destined to run a rapid and fatal course), our chief interest must center in the child in whom we can apparently —I use the word advisedly—effect a cure, or in whom we may be able to prevent the development of the disease, or even the entrance of infection.

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* Read before the New York Academy of Medicine, Section on Pediatrics, March 11, 1915.

In proceeding to the discussion of the care of the actively tuberculous child, particularly when we include those who are suffering from pulmonary manifestations of the disease, let me emphasize that the most important preliminary step is to make an accurate diagnosis, and that it is necessary to remind ourselves that familiarity with tuberculosis, as seen in the adult, is of little value in aiding us to detect active disease in the child. I merely mention this because my own experience has led me to realize how easy it is to be mistaken, especially on a single examination, and because in the position I occupy in a children's tuberculosis clinic, I see such a large number of cases which are referred for examination or treatment in which careful and longer observation shows that an incorrect diagnosis has been made. When it comes to treatment, we pin our faith to the same trio, which are our mainstays with the adult: rest, fresh air and superalimentation. It is perhaps rest which I would especially emphasize, as it is my impression that it is not generally given the attention it deserves. The fact that nutrition does not suffer to a serious extent in early tuberculosis in childhood, and readily responds when food is increased and the appetite is stimulated by a properly changed environment, the absence of fever (by mouth temperature) in early, and even moderately advanced cases, and the appearance of rapid improvement and general well-being which soon occurs in a child under the treatment, tend to throw us off our guard.

The orthopedic men have long appreciated the necessity of absolute rest of the affected part, in tuberculous bone and joint disease, so long as the process is active, if they wish to obtain satisfactory results. It has been my experience that the element of rest is equally essential in pulmonary lesions. If the disease is other than quiescent, lack of restriction of exercise means that the pulmonary signs do not improve in proportion to the improvement in the general condition.

Two cases during the last few years have impressed this forcibly upon me. A girl of twelve who had ceased to make progress at the day camp was sent to a sanitarium. There in a few months she gained ten pounds. Examination made shortly after return showed somewhat more extensive involvement and a pulse ranging from 110 to 120. She had been allowed to dance at the institution. A boy of eight, sent away for the same reason, remained at a sanitarium for ten months. He gained twenty pounds, and returned positively obese. A week after his return examination showed unchanged signs, and a sputum positive for the first time since his illness. His exercise had been practically unrestricted.

While the temperature does not seem to be affected in children by the toxemia, or by exercise, the pulse is particularly susceptible, and it is well to use this to estimate the amount of exercise in which a child may indulge.

At the Bellevue Day Camp each child's pulse rate is taken daily, and averaged monthly. It is most interesting to note the gradual fall in rate and the decreased range from month to month; the improvement in physical signs going hand in hand with this return of pulse rate to the normal.

As the child improves, more and more exercise can be introduced. In sanitoria and municipal camps, a children's garden can be used admirably for this purpose. Exercise must be graduated, the pulse and temperature noted before exercise and one-half hour after it, and the work graded according to its effects. Work of this sort should not be permitted in the heat of the day, or in hot and muggy weather.

Keeping the child mentally satisfied with quiet occupations is an important element of treatment at day camps, and if accomplished, simplifies the problem of restricted exercise. This mental employment may be particularly necessary for the high-strung child, for in this type especially, according to Czerny, tuberculosis has a distinctly poorer prognosis. Schooling, always in the fresh air, may be permitted. I prefer limiting it to three hours daily, and find cases in which its influence is unfavorable are rare. Rest in a reclining posture is insisted on for one hour after the mid-day meal. For cases in a quiescent, or apparently arrested stage, postural and breathing exercises exert a marked benefit; as many children with tuberculosis have a poor chest development, and most atrocious posture, with the attendant lumbar lordosis and abdominal ptosis.

The value of the second of our trio, fresh air, is well established and appreciated by all. The nearer we can get to having it twenty-four hours daily the better. The utilization of out-of-door sleeping porches in the country and an arrangement like the Knopf window tent in the city, suggest themselves for that class of patients who can afford them. I think we have come to believe that it is fresh air rather than the air of particular localities, which is valuable, though I appreciate the fact that an equable climate, in which the temperature is fairly cool, with an absence of dust and high winds, is the most satisfactory. Excellent results, however, may be obtained with children in New York City, and with only eight to ten hours daily spent under proper hygienic conditions. From a climatic standpoint the one particularly bad combination is heat and humidity; and in summer when these are prevalent, as they are in New York, the child should be moved to a cooler and more invigorating climate. This is being appreciated in our municipal work, and in this city each year a considerable number of tuberculous children are sent away for the summer months, under conditions which will insure their having proper medical supervision. In the last two years, I have seen very great benefits accrue from this procedure.

In cases of bone and joint tuberculosis, I believe the general impression is that the best results are attained at or near the seashore. The excellent results recently obtained in the Alps with heliotherapy suggest that possibly the larger amount of sunshine at the sea-shore may have more to do with the improvement than the altitude.

As to diet, high calory foods are indicated until the weight is normal, or slightly above it. It has seemed hardly feasible to me to work a diet out on a scientific basis. At the day camp I have had no means of knowing the caloric value of the children's morning and evening meals, and at any rate I am not at all convinced of the necessity of planning such a diet. The tables of Herbst, Hasse, Cammerer and Uffelman show that there is a wide variation of opinion as to the necessary calories per kilo in a maintenance diet in childhood; and when one reflects that these are tables of averages, even wider variations must be left for individual cases.

The type of diet which seems to be most suitable is the one that has been employed for years, namely, that which is high in fat and proteid. Schlutz, in a recent article, has shown that even in fairly advanced cases of pulmonary disease in children, the ability to absorb fats is little impaired. There is more difference of opinion in the case of glandular and skin affections. The animal experiments of Weigert seem to show that there may be a scientific basis for the use of the diet which we now employ. Animals infected with tubercle bacilli, and fattened rapidly with a diet rich in carbohydrates, showed a high water content of their tissues, and but little fat-free residue. The resistance of these animals was uniformly less than those on a high protein and fat diet, which showed a low water retention and much fat-free residue.

Digestive disturbances are less likely if superalimentation is brought about slowly. If they do occur, or if there is a failure to gain satisfactorily without adequate explanation in the local or general condition of the patient, much valuable information can sometimes be obtained from a careful stool examination. Constipation should be avoided, and with the day camp children, where the diet cannot be so carefully regulated, I have found digestive disturbances much less frequent, since the routine weekly administration of castor oil. During hot weather great care must be exercised in the use of forced feeding, and on days with extreme heat and humidity, it should be avoided altogether.

It may be of interest in passing to know that on the day camp ferry boat, which is somewhat in motion from the swells of passing vessels, a number of children who on first going there had gastric upsets, were free from them after having properly fitted glasses.

Of our adjuvants to rest, fresh air and feeding, we may mention first tuberculin. I have used it in a number of cases. In my pulmonary cases I have used it only in those who did not tend to improve as they should under ordinary remedial measures. I cannot say I have seen any remarkable results. At the same time I feel that there have been no untoward effects, a fact of equal importance. Usually I have employed old tuberculin, in some cases boullion filtrate. My initial dose is usually .00000001 gm., in some cases 1/10 of that. Doses are given twice a week and only to children who can be kept under close observation. For three or four years I have employed a percentage scale of increase, and since the adoption of that, I find that reactions have practically disappeared. My usual increase for each dose has been twenty-five per cent. which gives ten doses to a bottle, the way tuberculin solutions are usually prepared. In some susceptible cases, a twenty or even a fifteen per cent. increase has been employed. There are some children who are very susceptible to tuberculin, and in them a dose slightly larger than .000000001, may produce a local reaction. It is not safe to ignore a local reaction when it occurs early in treatment, as I have seen in at least one of these susceptible cases a considerable increase in the extent of the râles in the chest after a local reaction, although no general reaction occurred.

In cases of cervical gland tuberculosis, I am distinctly enthusiastic over the use of tuberculin. In several of my cases in which the swelling was sufficient to disfigure markedly the contour of the neck, it has receded to the size of a finger tip in three or four months treatment. These results have been obtained when the glands were not softened. Surgical measures are indicated where caseation exists, or where the glands are present in great numbers. Surgical opinion, on the other hand, leans more toward radical measures. It was interesting to me on that account to read Robert T. Morris's statement, that he had not operated once for non-suppurative glands in the last ten years. Jopson, on the other hand, in the ARCHIVES OF PEDIATRICS, 1913, deplores the conservative treatment of tuberculous adenitis. It is interesting to note he objects to tuberculin treatment, as opposed to surgery, on the ground of expense. In all cases of tuberculous adenitis, where surgical measures are resorted to, great care should be exercised if caseation is present, to avoid flooding the exposed tissues with tuberculous poison, thus setting up an intense tuberculin reaction, which in turn may lead to serious consequences through lighting up active foci elsewhere in the body. I have had no experience with Rosenbach's tuberculin or with von Ruck's vaccine. Regarding the former, I am distinctly opposed to the employment of any therapy, the object of which is to produce reactions which we cannot limit, and in tissues the exact pathological condition of which we are ignorant of. The Roentgen rays have always seemed to me to be of more value in diagnosis than therapy, in tuberculous conditions.

The treatment of bone and joint tuberculosis is peculiarly the process of orthopedic surgery. While I have had no experience with its use in this field, I should think that tuberculin might be of distinct help. From reports, heliotherapy seems to be of great value. Fresh air is important as for the pulmonary form.

Pneumothorax should be of value in some cases as it is in adults. Vogt and Pielstieker claim that it can be used with benefit in very young children. I have had no experience with it.

Among minor remedial measures the hygiene of the mouth, nose and throat is important. Dental caries should be remedied. The life in the fresh air will usually reduce considerably any infection present in the upper air passages, and render them much less susceptible to infection. Not only among tuberculous children in the fresh air, but also among normal and tuberculously predisposed children in the open air classes in New York, colds are of rare occurrence. In spite of the improvement which occurs as a result of environment, nasal treatment is frequently indicated. A larger proportion of children than is generally supposed suffer from atrophic rhinitis, and the irritating discharges from this affection keep up a chronic pharyngitis, if the condition is not relieved. In a certain proportion of cases signs in the chest will not clear up until the removal of adenoid tissue in the nasopharynx. I am strongly in favor of removing adenoids in tuberculosis when the disease has been quiescent, or apparently arrested. If the tonsils are hypertrophic, they should be removed, but I believe at a later date, as the operation requires a longer anesthesia. I have seen no unfavorable effects on the pulmonary lesion in a number of adenectomies, and as stated, marked improvement in some resistant cases.

When should the tuberculous child be permitted to resume its normal life? In general it may be said when the pulmonary signs have entirely disappeared, or have remained stationary, or inactive for a period of months; when the nutrition is normal; the pulse of normal rate and range, and of good stability; and when various physical defects, which might tend to be a handicap, have been removed.

There is too great a tendency to allow children with tuberculosis to return to their normal environments and habits, simply because their general condition is good, though the signs in their chests are still marked. When this is done they usually go slowly down hill and lose all the benefit of their previous treatment.

In general, I am opposed to the administrative management which permits tuberculous children in an active or quiescent state to attend school in ordinary classrooms, if they have no tubercle bacilli in their sputum. This is now permitted in New York City. I believe, with the adoption of the new sanitary code, the Board of Health will have the power to exclude all children with pulmonary tuberculosis, whose disease has not attained an apparently arrested condition.

AFTER CARE

The fresh air class is the best avenue by which a child may return to its normal life. A cured case should sleep constantly with the window open, or, if practical, out of doors. Each child should be discharged on probation, and at first should report once a month for examination. Later, if his health remains good, the period can be lengthened to once in three months, and finally but once in six months. Where it is possible, such a child should be kept under observation, and report once in six months for a number of years.

As a phase of after care special attention should be paid to the condition of the general nutrition and chest development. Periods of rapid growth should be carefully watched. Especial pains should be taken to safeguard these children against whooping-cough and measles. The mothers should be warned that any cold, or infection of the respiratory tract, however slight, should be treated as a serious disease, and the child kept in bed until the symptoms disappear. Such a child should receive a vacation of three to four weeks annually in the country, and where the case is under clinic care, and the family cannot afford the expense involved, provision should be made that these children especially be put on the vacation list.

One important phase of the after care of bone and joint cases is largely municipal. Many of these cases both arrested and quiescent are permanently crippled, and form thirty to forty per cent. of the number of children in the crippled classes in the public schools. Because of their disability most of them are entirely deprived of any outdoor life. It is highly desirable that all such crippled classes be converted into open window classes so that these children for four or five hours daily may receive the fresh air which is so necessary to their health.

In this day no discussion in regard to the tuberculous child would begin to be complete, which did not give consideration to the question of prophylaxis. Measured by its importance it dwarfs the care of the child which has become actively tuberculous.

The presence of positive von Pirquet reactions, in about fifty per cent. of all children who have arrived at puberty, suggests at least that the origin of adult tuberculous infection is found in childhood, and I am strongly inclined to agree with McCleave, who says of the strife against tuberculosis in adults, that much of the effort and money "is wasted until it is directed to basic preventive work among children." The title of his paper, the "Relation of Bovine Tuberculosis to Early Tuberculosis in Children," immediately suggests in connection with human infection the separate and distinct lines along which prophylaxis must be conducted. Bovine infection has already been ably discussed this evening, and any extended treatment is outside the scope of this paper. It suffices to say that more and more is it appreciated that bovine tuberculosis is a menace. Von Behring asserts that bovine tuberculosis may cause pulmonary tuberculosis, and that the actual source of adult tuberculosis must, in a fair proportion of cases, be referred to milk infection in infancy; the bacilli lying latent over long periods, owing to the great resistance to tuberculosis which frequently obtains in childhood. Other observers estimate that from ten per cent. (Orth) to twenty-five per cent. (Rosenau, as quoted by McCleave) of tuberculosis in childhood is caused by bovine infection.

The United States Bureau of Animal Industry estimates conservatively that from twenty to thirty per cent. of the dairy cows in this country are tuberculous. Such figures show that bovine tuberculosis is a menace of sufficient importance to be given serious attention. Theoretically, the eradication of the disease from cattle is the main object. Probably none of us will live to see the day of its accomplishment. As practicing physicians, until the millennium arrives, we must endeavor to render dairy products, especially milk, safe for consumption. Raw milk can be relied upon only when obtained from certified herds under proper supervision. I am informed by Dr. Park that pasteurization, at a temperature of 145° degrees, for thirty minutes, effectually destroys tubercle bacilli. In all municipalities where this is conscientiously carried out, and rigidly checked by an adequate system of inspection, milk may be considered, from the standpoint of infection, safe for use by young children. At present, we may gladly state that such is the case in New York City. Where such standards of supervision do not prevail, we must impress on the public the necessity of pasteurization, especially in the country, or better still, if its use is temporary, of boiling milk intended for children's use. Too often a healthy looking cow and a fairly clean barnyard is taken as sufficient evidence of safe milk. We are often too prone to tell our patients that the short time elapsing between milking and consumption eliminates the necessity of any protective measures.

The other aspect of the question of prophylaxis, namely, the prevention of infection from human sources, presents many problems. Broadly it may be said that our aims are:

1. How to prevent the entrance of infection.
2. With infection once present, how to localize it and to prevent its extension and development that we may bring a child so infected up to adolescence, with the greatest possible resistance against the disease.

Unfortunately we do not frequently have the opportunity of solving our first problem, as the little ones are so often infected when the disease is first discovered in the adult. The separate consideration of these two problems is really academic. The general measures to be employed are practically the same in both; for it is as important to prevent the repeated and frequent ingestion or inspiration of small doses of tubercle bacilli, as to prevent their entrance in the first place.

The fundamental aims of this prevention are the same in all cases. The degree of success or failure depends largely on the intelligence of the adult patients and their willingness to cooperate; on the financial condition of the family; the resourcefulness of the physician; and, in civic work, on the thoroughness of its organization, and its degree of appreciation of the importance of the child as a factor in the tuberculosis movement.

The measures to be taken to realize these aims of necessity vary with conditions. In general we must aim, first, to prevent too intimate contact with the infected member or members of the family, and to reduce the amount of the infectious material in the home to the minimum. Among the well-to-do, the general measures to be employed immediately suggest themselves to you. I am taking the privilege of emphasizing the need of the exclusion from the patient's bedroom, or any room he habitually frequents, of young children who creep or play on the floor; of the abolition of carpets, and if possible of large rugs; of the employment of dustless methods of cleaning, especially vacuum cleaning, and of particular attention to what we may term the hygiene of the nursery floor. This should be wiped up daily in a dustless method, and I am strongly in favor of the employment of rag rugs, which are washable, or some covering for the rugs (bleached muslin, if necessary), which may be fastened over the rugs and washed weekly. It is only by the use of any such material that one appreciates the filthy condition of our floor coverings, even under the most approved methods of cleaning. In municipal work such measures include the iteration and reiteration of the necessity of care; the provision of a separate sleeping room for the adult patient and the removal of the patient, if necessary, from the family; the sending of children at intervals to preventoria, if such are available; the finding of sanitary housings; and education in cleanliness and hygiene.

Our second aim must be to build up the children exposed. This includes particularly improving the state of nutrition of those children in whom it is subnormal; the corrections of defective posture and chest development by appropriate exercises, which in turn build up the general physical and muscular tone, of which the poor posture is frequently an expression; and the correction of various physical defects, especially dental caries, adenoids and hypertrophied tonsils. As to the removal of adenoids and tonsils, there may be some ground for difference of opinion as to the desirable method of treatment in the average child, but in the child exposed to tuberculosis, the sooner any possible nidus for tubercle bacilli is removed, the safer is the child against the development of infection. Especially is this true of children under clinic care, among whom there is no such thing as hygienic care of the nose and throat.

Wherever open air classes are available, there should be close co-operation between the agencies interested directly in the tuberculous child and that branch of the Department of Education which has these classes under its control. No child is more in need of the benefit of such treatment, be he healthy or sickly, than the child exposed to tuberculosis, and the excellent results which have been obtained in such classes in New York and elsewhere show that they are a big factor in improving the health of the subnormal school child, and in maintaining that of the normal child at its optimum.

Apparently healthy children who are exposed should be seen by their physician once in six months at any rate. Those who are subnormal, more frequently, as the occasion requires. All exposed children should have a cutaneous test on their first examination, and all children born into tuberculous families, under medical supervision, should be so tested soon after birth. Children who do not react should be tested every four to six months, the shorter intervals being employed for the younger children.

Such a routine practice is of real value in two ways. In the first place if reliance can be placed on the milk supply, it is a good indicator of the success of the sanitary supervision of the family. The development of a possible skin test in a child proves the lack of proper care on the part of the patient, and that he or she is a distinct menace to the other members of the family, especially the younger ones, who are usually in closest contact. In the second place, it offers a definite suggestion for treatment. We believe that children under three or four years of age who react to tuberculin are in need of medical care on the ground that in them the foci are usually active. Is it not logical to assume that any child under observation, who, previously inactive, suddenly reacts, is similarly in need of especial care on the ground that its focus of infection is active and not yet properly circumscribed? In cases under clinic care, these children especially are suitable for preventorium treatment.

The care of children under four years of age who react to tuberculin is still a serious problem in municipal work, as Hess has recently emphasized. I believe that since his publication, some provision has been made for the care of such children at Farmingdale. These children are too young to go to day camps, and are at an age at which, despite their active disease, they are obliged to remain at home, the environment in which they originally acquired their infection.

Holleneen and Lowatschek advocate the systematic use of tuberculin in infants and young children who show a positive reaction, and report results much more favorable than were previously thought possible. In considering these reports, one must remember that our views regarding tuberculosis in the first year of life are changed considerably since six years ago, when Wolf-Eisner wrote: "Erkrankt ein Kind im Ersten Jahr aber an Tuberkulose so ist die Infektion stets identisch mit Tod an Tuberkulose." There must be available for comparison a much greater number of cases of infants showing a positive skin test before we can decide whether the prognosis is much better in those receiving tuberculin than in those to whom it is not administered, and who are under the same care and in the same environment.

Such, I believe, are the chief points to be emphasized in our preventive work in children. Such are the lines along which we may hope to achieve our best results.

The accomplishment of results is no easy task, even in an organized clinic, with a staff properly appreciative of the importance of systematic work along the lines that have been laid down. The vastness of the problem may be appreciated when not only the public and the medical profession in general, but even many special workers in tuberculosis, have failed to appreciate the importance of preventive work in children, and have little conception of the lines along which such a campaign should be conducted.

ETIOLOGY OF SCARLATINA—Editorial writer (Presse Méd., June, 1914) questions whether the old idea of the propagation of scarlatina by means of scales has any foundation except as the scales have become inoculated by discharges from the mouth and throat. He explains thus the undoubted cases of conveyance by means of letters, and clothing that has been carried for long distances. The hands have been infected from the mouth and so scales have remained in the letters, or the discharges have remained on the garments. Persons who approach the patients may carry germs in their clothing, shoes and hair when they have come in contact with discharges. The germ of scarlatina is not eliminated directly by the skin. Inoculations of monkeys have proven the virulence of exudations from the tonsils. The virus of scarlatina is very resistant and remains active for many months. The author believes that abortive attacks of scarlatina with no rash are frequent. At the same time the throats contain virulent germs, which they spread about because no isolation is carried out. Epidemics of scarlatina coincide with epidemics of sore throat and these sore throats are probably true scarlatina. A most important prophylactic measure is careful disinfection of the mouth and throat in all cases of sore throat. The scarlatina patient may convey contagion from the first moment of his illness by the discharges from the mouth. By remembering these facts we shall be able to construct a better system of prophylactic care of the patient and insure the community against the spread of the disease.—*The American Journal of Obstetrics.*

IMMUNIZATION AGAINST MEASLES*

BY CHARLES HERRMAN, M.D.
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Although the mortality from measles has been somewhat reduced, the morbidity remains as high as ever. On several occasions I have stated that this high morbidity could only be distinctly diminished by immunization against this disease. For several years I have had a method in mind, but it was only about two years ago that I gathered courage to test the method. For the sake of convenience I shall divide the discussion of the subject into: (1) Is it worth while? (2) Important facts bearing on the problem. (3) The method of immunization and its results.

(1) From 1900 to 1910, in the registration area of the United States, 44,080 deaths from measles were recorded. In 1910, 6,598. In 1913 in New York State 1,075 deaths were caused by this disease. In New York City, during the ten years from 1903 to 1912, the average number of deaths annually was: from measles, 957; scarlet fever, 939; whooping-cough, 393. In 1913, 628 deaths were due to measles, 507 to scarlet fever, and 420 to whooping-cough. These figures, however, do not represent the entire mortality, for many patients die of complications and their deaths are recorded as due to these complications. In New York City about 30,000 cases of measles are reported annually; but as many patients have no attending physician and as some physicians fail to report all their cases, a conservative estimate would place the real number at about 60,000. This disease is therefore important on account of the large number of persons affected; 95 per cent. of the entire population are infected at some time during their life. Add to the larger number of deaths the complications and sequelæ, pneumonia, otitis, adenitis and tuberculosis, which often cause permanent injury, and I believe all will agree that the subject deserves serious consideration.

(2) Infants under five months are relatively immune to measles. This immunity is striking because practically all other children who come in intimate contact with a case contract the disease. In the rare instances in which they *are* infected the disease appears in a mild atypical form. This may explain the

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* Read at the Annual Meeting of the Medical Society of the State of New York, April 28, 1915.

apparent difference of opinion. For example, Sperk observed a certain number of cases under five months in the infant wards of the hospital. These were not healthy infants; in many instances the manifestations were so slight that they would have been entirely overlooked if the patients had not been under constant and careful observation, and if there had not been an epidemic of measles in the hospital at the time. All observers agree that under two months infants are absolutely immune. It is interesting to note that in countries in which the disease is not endemic, in which the mothers have not had the disease or have it during pregnancy, the infants are not immune during the first five months. There is apparently no great difference in the degree of immunity between breast-fed and artificially-fed infants.

When infants of six or seven months contract the disease it usually appears in a mild form, indicating that the immunity becomes less marked toward the end of the first year, for during the second year it is entirely absent and it is at this age that the disease causes the greatest number of deaths.

Infants under five months who have been in intimate contact with a case of measles and have not been infected, frequently do not contract the disease when exposed later. Four such cases have come under my observation.

(*a*) J. F., when he was four months old, came in intimate contact with his brother who had measles and was not infected. When he was three and one-half years a baby sister of eleven months had the disease and he did not contract it.

(*b*) W. W., exposed at four months and did not contract at five years.

(*c*) A. S., exposed at three months and did not contract at three years.

(*d*) R. T., exposed at three months and did not contract at four years.

Swoboda, in a discussion on measles (Jahrb. f. Kinderhk., 80, p. 337) mentions the case of three sisters (women) who had measles and all of whose children contracted the disease except an infant of four months, which was nursed by the mother while she was sick. The child at six years had not yet contracted the disease.

I have recently had under observation a family whose history is most instructive in this connection. There are 7 children aged fourteen, twelve, ten, eight, six and one-quarter, four and one-half years, and the youngest ten months. The oldest child had measles eleven and three-quarter years ago; the second child was three and one-half months old at the time and did not contract the disease. The third and the fourth child had measles six years ago; the second, though exposed, did not contract it; neither did the fifth child, who was then three months of age. The sixth child had measles two years ago, and again the second and the fifth child were not infected. The seventh and youngest child I recently observed in an attack of measles, and again the second and the fifth child remained free.

One attack of measles usually protects for life. Exceptions to this rule occur, but they are rare. In the majority of cases such a supposed second attack is based on an incorrect diagnosis.

The immunity which the infant enjoys cannot be transferred by the mother solely through the breast milk, for as the figures given in a previous paper (ARCHIVES OF PEDIATRICS, December, 1914) show, artificially-fed infants are also immune. It seems most probable that the immunity is conveyed through the placental circulation; however, it is not impossible that the infant elaborates its own antibodies. In this connection it may be worth noting that recent investigation (Groer) has shown that the characteristics of the antitoxin present in persons who have never had diphtheria (as found in the newborn) are identical with those due to immunization.

The experimental work of Hektoen, Anderson, Goldberger and others on human beings and monkeys has shown that the blood and the nasal and oral secretions of patients suffering from measles contain the infectious agent from twenty-four hours preceding to twenty-four hours following the appearance of the eruption. It is a filterable virus, but in Anderson and Goldberger's experiments only a small percentage of the inoculated monkeys were infected by the filtrate. The infectious material loses its virulence when kept for more than twenty-four hours.

To recapitulate: One attack of measles usually protects for life. Infants under five months are relatively immune. The nasal discharge contains the virus twenty-four hours before the appearance of the eruption.

(3) It has long been the custom to intentionally expose children to infection with measles so that it would be over and done with, as they were almost certain to contract it sooner or later. Had this custom been attended with great danger we may be

sure that it would have been long since abandoned. The real danger in this procedure lay in the uncontrolled selection of patients. In infants between the age of one and two years; in weak, poorly nourished infants or in children who were predisposed to tuberculosis such a procedure would be absolutely unjustifiable and dangerous.

Having convinced myself from a very large number of personal observations that infants under five months of age were relatively immune, I obtained the consent of a mother to inoculate her infant, then four months old, explaining that the object was to render it immune against measles in the same way that vaccination protected against small-pox. It seemed fair to assume that as the infant at that age was not absolutely immune direct inoculation would convert a temporary into a more or less permanent immunity. The child was carefully observed and at no time did it present any evidence of injury. I then proceeded cautiously to immunize others and in no case was any unfavorable symptom noted. The material for inoculation was obtained from otherwise healthy children, taken *twenty-four hours before the measles eruption appeared.* For obvious reasons the *mucus* from the nose was taken. This was collected on small swabs of cotton and kept in glass vials. A moist chamber was improvised by placing a moistened piece of blotting paper at the bottom. Only perfectly healthy infants under five months were inoculated; they first were tested with the cutaneous tuberculin test, but when it was found that 10 consecutive cases gave a negative reaction the test was deemed unnecessary. The inoculations were made by applying the swab gently to the nasal mucous membrane. Up to the present time 40 infants have been inoculated at the following ages: 1 at two and one-half months; 4 at three months; 3 at three and one-half months; 6 at four months: 15 at four and one-half months, and 11 at five months. The inoculations were made by preference between the fourth and fifth months because as the immunity was not absolutely at that time it seemed more likely that the organism would react with the formation of antibodies. The majority of the infants showed no distinct reaction; 15 had a slight rise of temperature, from 100° to 101°, varying in its appearance in different cases from the eighth to the fourteenth day. Possibly a larger number of slight reactions would have been detected if the infants had been under constant observation. In a few instances a small number of spots were noted on the face or body varying in the time of their appearance from the fourteenth to the eighteenth day; but these were so few and indistinct that they would ordinarily have escaped detection. Of the 40 cases inoculated, 4 over one year of age have since come in intimate contact with cases of measles and have not contracted the disease. In addition, having satisfied myself that those who were inoculated were really immune, 2 of the 40 cases were re-inoculated at the age of twenty-one and twenty-three months respectively. In both the result was negative.

In view of the fact that the virus of measles has been shown to be filterable, it would seem preferable to use the filtrate. I therefore prepared a filtrate by thoroughly mixing the mucus with a normal saline solution and passing it through a Berkefeld candle. (For the privilege of utilizing the facilities of the laboratory, I am indebted to Dr. Eugene P. Bernstein, pathologist to the hospital.) However, from some experimental work which I have done, I believe that the filtrate is *usually* non-virulent and could not be depended upon for the purposes of immunization. It will be noted that Anderson and Goldberger, using the filtrate from the blood, only succeeded in infecting about 20 per cent. of the monkeys inoculated.

It would be desirable to devise some method by which the infectious material could be made to retain its virulence for more than twenty-four hours. I believe that the method which I have outlined presents a safe and simple means of immunizing against measles.

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MIDDLE EAR COMPLICATIONS OF MEASLES IN IMMIGRANT CHILDREN—Judging from 1,769 cases of measles observed at Ellis Island, H. C. Cody (American Journal Diseases of Children, 1914, Vol. VIII., p. 147) states that suppurative otitis media occurs as a complication of measles in immigrant children; that is to say, in children subject to unfavorable hygienic surroundings both at home and on board ship, in nearly 20 per cent. of cases. Mastoid involvement is not common, and the disease yields to treatment comparatively readily. The disease is essentially subacute (rather than chronic) and the apparent results as regards hearing are good.—*The American Journal of Obstetrics.*

THE PERMANGANATE TEST FOR SPINAL FLUID, WITH REPORT OF A CASE OF TUBERCULOUS MENINGITIS WHERE ALL OTHER TESTS WERE NEGATIVE * †

BY ERNEST LACKNER, M.D.

AND

A. LEVINSON, M.D.

In 1910‡ Mayerhofer described the determination of organic substances in spinal fluid by a potassium permanganate solution, the method having originally been described by Kubel-Thiemann for the determination of organic substances in water. Mayerhofer showed that every spinal fluid oxidizes, or, as he termed it, reduces, permanganate, and that spinal fluid in cases of meningitis has a higher oxidation index than normal fluids or even those of meningismus. He therefore suggested the use of the permanganate index for diagnostic purposes. In a subsequent publication§ he, together with Neubauer, corroborated the first findings and demonstrated by a series of 100 cases how the permanganate could be of value in assisting toward a correct diagnosis in cases of tuberculous meningitis or meningismus. Since nothing, to our knowledge, has been written on this subject in English, we consider it worth while to describe the method and the principle. We shall also report one of our cases where the permanganate was the only positive test for tuberculous meningitis, all other tests on the spinal fluid having been negative.

Method—1 c.c. of the spinal fluid is measured in an accurately graduated pipet and introduced into an Erlenmeyer flask; 50 c.c. distilled water and 10 c.c. of diluted H_2SO_4 (1 part H_2SO_4, and 3 parts H_2O) are added and the mixture is brought to boiling point; 10 c.c. of a decinormal permanganate solution is then introduced into the flask and the solution is boiled for exactly ten minutes. At the end of the time 10 c.c. of decinormal oxalic acid is put into the flask, whereupon the red or yellowish-red color turns white. Titration is carried on drop by drop from a buret containing permanganate solution until the color of the solution in the receptacle turns red and remains so for a number of minutes. The number of c.c. of permanganate required to produce the end reaction is then read off and the figure is taken as the permanganate index. In doing this one must, however, make certain that 10 c.c. of N/10 permanganate equals 10 c.c. N/10 oxalic acid. It is also necessary to ascertain how much permanganate is required to oxidize the water and the H_2SO_4, and this amount should be subtracted from the number of c.c. of permanganate required to oxidize the spinal fluid solution. For example, if 4 c.c. of N/10 permanganate was required for the spinal fluid and 0.5 c.c. permanganate for water and H_2SO_4, the 0.5 c.c. should be subtracted from the whole number, leaving the reduction index only 3.5.

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* Read before the Chicago Pediatric Society, February 16, 1915.

† From the service of Dr. Ernest Lackner, Sarah Morris Hospital, and from the Nelson Morris Institute for Medical Research.

‡ Zur Charakteristik und Differential Diagnose des Liquor Cerebrospinalis. Wiener Klinische Wochenschrift, Vol. XXIII., No. 18.

§ Über Meningitis Tuberculosa und Meningitis Serosa. Zeitschrift für Kinderheilkunde, 1911, Vol. III., No. 2.

Principle—Permanganate is an oxidizing agent. Sulphuric acid is a dehydrant. In order to have the permanganate oxidize the organic substance, dehydration is done by the sulphuric acid. The oxidation, however, takes place best on boiling, ten minutes being the time found necessary for the process. The 10 c.c. of N/10 permanganate is neutralized by 10 c.c. of N/10 oxalic, leaving the organic substances again free for oxidation. The amount of permanganate needed to produce the end reaction after the first 10 c.c. has been neutralized is the index to the amount of organic substances in the fluid. The greater the number of cellular elements in a solution, the higher the index.

Application—The spinal fluid in normal cases, or even in meningismus (tumors, hydrocephalus, enteritis) has little organic substance. As a result the permanganate index is low, while the organic substances in the spinal fluid of meningitis are increased, and therefore the permanganate index is higher.

Mayerhofer has also found that different portions of the same spinal fluid (at least first puncture) vary in the amount of organic substances they contain, different conditions giving different curves. In tuberculous meningitis the first portion of the fluid contains more organic substances than the second, the second more than the third, each portion being about 10 c.c. in amount. In meningismus the reverse is true, the consequent portions containing a greater amount of organic substances than the preceding. Both of these findings are therefore of diagnostic value. A permanganate index of 2, (that is, 2 c.c. of permanganate, after subtracting the amount needed for the reduction of water) is taken as the standard. An index higher than 2, especially if the first portion of the fluid is higher than the subsequent ones, speaks for tuberculous meningitis. An index lower than 2, particularly if the subsequent portions are higher than the preceding, speaks for a meningismus.

Summary—The results of Mayerhofer's work are summarized by him in the following conclusions:—

(1) The reduction index of normal spinal fluid is low. The different portions of the same fluid give either the same reduction index or different ones, the subsequent portions having a higher index than the first.

(2) The reduction index of fluids in meningitis is higher than that of normal spinal fluids. (2 and up.) The index becomes lower with the succeeding portions.

(3) With the injection of meningococcic serum to the patient suffering from epidemic cerebrospinal meningitis, the reduction index drops to about one-half the original pathological index.

One of us (Levinson) has done permanganate determinations on a great number of spinal fluids (detailed report of the cases will follow in a subsequent paper), and has come to the conclusion that the permanganate method is of great assistance in the diagnosis of meningitis. While it is hard to differentiate by the permanganate method the type of meningitis it is nearly always possible in the examination of the first puncture to ascertain whether the case is a meningitis or only a meningismus. The following case is one where the permanganate test helped us in the laboratory diagnosis in the absence of all other laboratory findings.

REPORT OF CASE

Max Mahrn, age seven years and six months. Admitted to the hospital December 9, 1914. Present complaint dates back to Friday noon, December 4, 1914, when the child returned from school and complained of headache. At two o'clock in the afternoon the child went to bed, and an hour later when his mother went to look at him she found him sleeping but foaming at the mouth. She shook him for a few minutes, but he only stared at her. A physician was summoned and mustard plaster applied by him to the region of the heart. The child regained his voice and started to cry twenty minutes after the application of the mustard, complaining of pain due to the plaster. He seemed to remember nothing of what had happened during the time and was unable to talk. All night the child was cold, and hot-water bags were constantly applied to his hands and feet.

Saturday, Sunday and Monday he felt well except that he vomited once after eating, and when evening came on he complained of headache. Doctor said he had no fever Friday or Saturday. On Tuesday, December 8th, he vomited again after eating an apple. He was then given milk and a cracker, which he retained. After that he felt better, appetite was good, his bowels open.

Wednesday morning(December 9th) he was given some milk, which he vomited. After reaching the hospital he was given an orange, which he vomited also.

Previous History—Normal delivery, breast-fed. Measles at four years of age. Otherwise negative.

Family History—Father and mother living and well. Five other children all in good health. No tuberculosis in the family.

Physical Examination—General appearance that of a fairly well-developed and well-nourished boy. Arms, hands, legs and feet mottled, cold and cyanotic. Head negative.

Eyes—Some internal strabismus of left eye. No ptosis. Pupils small, equal, regular, react to light and accommodation.

Nose and Ears—no discharge. No tenderness over mastoid.

Face—Cheeks somewhat flushed. Lips dry, slight purplish tinge. Mouth, no Koplik's. Tongue slightly coated. Teeth in poor condition. Carious molars on either side.

Pharynx—Negative. Tonsils removed.

Neck—Symmetrical. Few palpable glands.

Thorax—Symmetrical. Good expansion.

Heart—Upper border, third rib; right border, 2½ cm; left border 6 cm. from midsternal line. Apex, fifth interspace, circumscribed. Systolic tone, harsh blowing at apex, transmitted upward along left margin of the sternum. Second pulmonic somewhat accentuated. Pulse, soft, regular.

Lungs—Right side somewhat hyperresonant. No dullness, no bronchial breathing. Little roughened breathing, left posteriorly. Few large, moist râles.

Abdomen—Soft, symmetrical, slight tenderness right iliac fossa.

Liver—Palpable two fingers below costal arch on deep inspiration. Spleen palpable.

Extremities—No edema. No deformity.

Nervous System—Superficial and deep reflexes present. No Babinsky; no Brudzinsky; no Kernig; no clonus.

Skin—Hands, arms and legs and feet mottled, cold, quite cyanotic. No eruption.

Genitalia negative. Glands negative.

Osseous—Slight tenderness over twelfth dorsal spine.

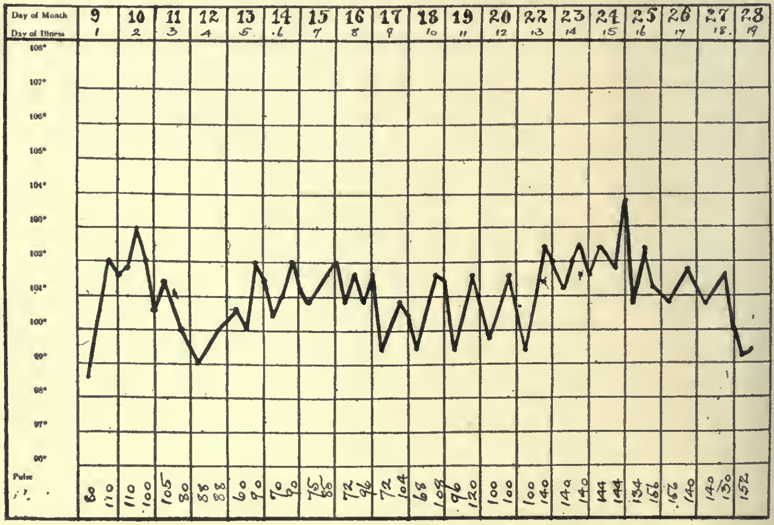
Temperature on entrance was 98°. In five hours it rose to 101.6°.

Urine—Specific gravity, 1,022, acid reaction. No albumin, no sugar, no casts, no cells. Acetone plus, urate crystals.

Blood—Hemoglobin, 85 per cent.; red blood cells, 4,386,000; white blood cells, 6,400. Differential—Neutrophiles, 85 per cent.; small mononuclear, 11 per cent.; large mononuclear, 1 per cent.; Tr., 2; B., 1.

Throat culture negative. Pirquet slightly positive.

COURSE OF DISEASE—For temperature and pulse see chart.



Temperature chart of case of tuberculous meningitis

December 10, 1914—Patient has small patch of vesicles at right angle of mouth.

December 11, 1914—Seems toxic. Lips dry. Tongue parched and somewhat coated, edges and tip red, raw appearance. Lungs negative. Heart negative. No rose spots.

December 13, 1914—Quite toxic. Lips dry, tongue coated, edges and tip red. Complains of pain in neck on sitting up. Slight rigidity. Kernig present, also slight Brudzinski (partly seems voluntary). Patient irrational during night. No Babinski. Complains of considerable pain upon trying to elicit Kernig, Brudzinsky. Spleen just palpable beneath costal arch. "Nose bleed" quite marked on examination.

Same Day—Spinal puncture performed. Fluid came clear. No blood. Rate fairly rapid. Amount removed about 12 c.c.

December 14, 1914—Blood for blood culture taken from arm.

December 15, 1914—Patient restless and irritable. Marked rigidity of neck. Slight opisthotonos. Marked Kernig. Marked Brudzinsky. Very sensitive neck and on compressing upper aspect of thigh. (Moser.) Marked bilateral internal strabismus. Much more marked than when patient entered. Was unable to elicit knee-jerks and Achilles reflex. No Babinsky.

Spinal puncture performed. Fluid clear. Rate, slow drop. About 15 c.c. removed in six tubes. Second and third slightly blood tinged.

December 16, 1914—Spinal puncture. About 6 c.c. collected in two tubes. Second slightly blood tinged. Fluid clear; at first rapid drop, later slow drop. Examination of eyes. Right fundus negative, left negative.

December 17, 1914—Pirquet slightly positive.

December 18, 1914—Ears examined, negative. Nose, slight crusting, otherwise negative. Roentgen examination of chest negative. Patient comatose. Unable to elicit reflexes due to rigidity.

December 20, 1914—Patient completely comatose, pupils dilated. React very little to light.

December 23, 1914—Spinal puncture performed, 20 c.c. clear fluid. No blood. Pressure markedly increased.

December 27, 1914—Patient emaciated. Deglutition impossible. Respiration labored. Mucus in throat. Exitus.

Examination of Spinal Fluid—

December 13, 1914—Ten c.c., clear. Cell count, 10 per c.mm. Lymphocytes, 100 per cent. Direct smear, (Gram) negative. Ross, Jones and Noguchi negative. No pellicle.

December 15, 1914—Cell count 3-5. 100 per cent. lymphocytes—smear and globulin test negative. Lange negative.

December 23, 1914—Cell count 15. 100 per cent. lymphocytes. Tubercle bacillus negative. Pellicle negative. Ross, Jones negative. Noguchi slightly positive.

Permanganate Tests—

December 14, 1914—The spinal fluid was drawn off in one tube, so that different portions could not be examined. The fluid examined gave an index of 3.4. The spinal fluid was also examined with Fehling solution for sugar reduction. Result negative.

December 16, 1914—Spinal fluid examined in three different portions:—

Specimen	I—	Permanganate	3.9
"	II—	"	3.
"	III—	"	3.

Fehling negative.

December 24, 1914—Three portions examined:—

Specimen	I—	Permanganate	3.4
"	II—	"	3.2
"	III—	"	2.8

Fehling negative.

As can be seen by the above report, all laboratory findings (with the exception of one doubtful Noguchi, late in the course of the disease) were negative, except the permanganate test, which showed at the first examination an index of 3.4, indicating a tuberculous meningitis.

AUTOPSY

Diagnosis—Tuberculous meningitis. Pulmonary tuberculosis. Disseminate miliary tubercular meningoencephalitis, involving especially the basilar, but also the adjacent areas. Very marked exudative fibrinous basilar pia-arachnoiditis. Caseating tubercular lymphadenitis of the posterior mediastinal (hilus pulmonary) nodes. Partially healed caseating tuberculosis of left lower lobe. Complete (bilateral) pneumonia with beginning hepatization. Hypostatic congestion of all lobes. Left-sided fibrous and fibrinous adhesive pleuritis. Passive congestion of liver and spleen.

Body—Is that of an emaciated male child, rather tall for his age. Osseous development good. Musculature poorly developed. Panniculus adiposus very little preserved. Skin has a waxy appearance. No pigmentation; no edema; no hemorrhages. Elasticity slightly decreased. Decubitus present to moderate degree. Wounds of aspiration needle present in lumbo-sacral region. Lividity pronounced in back and posterior of thighs. Rigor mortis present to a marked degree. The head is covered with a good growth of black hair. Ears, eyes and nose negative. Lips are covered with herpes, especially at labio-cutaneous junctions. The neck is long, slender and symmetrical. The thorax is symmetrical and normal in appearance. The abdomen is moderately retracted. Genitals are normal; the testicles lie in scrotum. The extremities appear normal.

Cranial Cavity—Scalp and skull appear normal. Dura: not adherent; vessels are congested. Pia: Vessels are congested. The whole base of brain from the optic chiasma to and including the first portion of the cord is covered by a thick serofibrinous coagulum or exudate. It covers especially the chiasma, the tuber cinerea, where it is 11 mm. thick, the pons medulla and upper part of ventral surface of spinal cord. This exudate is of the consistency of a thick jelly, grayish-white in color and obviously consists of a fibrin deposit. It involves the point of emergence of the cranial nerves 2 to 12. It also extends up along the temporo-frontal fissure for a distance of about 10 cm., *i.e.*, up unto the lateral surface of the cerebrum. There are many small firm white miliary nodules especially over the left temporal and frontal lobes on the basal surface. The nodules are very numerous and closely studded and are not more than ¼ mm. in diameter and flattened or disc-like. The cerebrospinal fluid escaping from the basal sinuses is clear, with only a slight trace of precipitate forming on standing.

Brain—Weight 1,370 grams. Except as noted above, the size, shape and consistency appear normal.

Thoracic Cavity—The pleural cavities contain only a normal amount of fluid. The left one has adhesions on posterior aspect of the lung from apex to base (both fibrinous and fibrous). The left interlobar fissure is obliterated by dense fibrous adhesions. The right pleura is free from adhesions and everywhere smooth and glistening.

Lungs—Left: Weight, 275 grams. The shape is normal. The interlobar fissure is partially obliterated by fibrinous and fibrous adhesions. Color of both lobes dark reddish with gray mottling. The anterior border of upper lobe is emphysematous and lighter in color; air can be expressed from this portion. With the exception of this emphysematous area the consistency of the whole upper lobe is increased; a frothy, bloody fluid in places purulent can be expressed from the alveolar tissue, which is obviously in a state of moderately early diffuse pneumonic infiltration without advanced consolidation. The lower lobe is of similar color and consistency. In the lower lobe near the anterior edge is an area of chronic consolidation about 1 cm. in diameter. It is firmer than the surrounding pneumonic tissue and is whiter, and at its center is an area of caseation about ½ mm. in diameter. This is obviously a tubercular focus. The hilus lymph nodes of the left lung are enlarged, one being caseated and ulcerated into the adjacent parenchymatous substance of the lower lobe. The posterior mediastinal nodes are also enlarged and fibrous.

Right: Weight, 320 grams. Shape normal. No interlobar adhesions and no pleuritic adhesions. Color is a dark reddish brown, mottled with gray. The posterior portions of all lobes are of a deeper color, approaching reddish purple (hypostatic congestion). All parts of all lobes are of very much increased firmness, being of a solid fleshy consistency, almost like that of liver. On section a frothy, bloody fluid may be expressed everywhere; in places this has a yellowish tinge and is thicker, being suggestive of an early purulent change. The lymph nodes of the hilus are enlarged, averaging 8 to 10 mm. in length. Pericardium is smooth and shining and contains only a normal amount of fluid.

Heart—Is about the size of the patient's fist and lies in normal position and is found in systolic contraction. Auricles contain moderate goose fat clot. Ventricles contain small, dark-red clot of blood. All values are competent to the hydrostatic test. No abnormality is found in the leaflets of the valves. Walls appear of normal thickness. The ascending portion of the arch of the aorta, about ¼ cm. from aortic valves, shows a small millet-seed-sized area of roughening and lying transverse of the lumen of the arch.

Thymus—Normal size and consistency.

Abdominal Cavity—Peritoneum is smooth and shining. Peritoneal cavity contains no fluid.

Liver—Extends to just below costal margin. Weight, 800 grams. Color, dark red. No adhesions present. Consistency normal. Surface smooth and shining. Capsule strips easily. Cut section appears somewhat congested. The markings are normal.

Spleen—Lies in normal position. Weight, 70 grams. Normal color and consistency. Surface smooth and shining and no adhesions present.

Stomach and Intestines—Are in normal relations and no abnormality found on cut section.

Pancreas—Appears normal in size, shape and consistency.

Kidneys—Are enclosed in a decreased amount of peri-renal fat, in size are normal. On section the markings are normal and relation of cortex to medulla as about 1 to 3. The pelvices of the kidneys are smooth and shining and present no suspicion of tubercle formation.

Adrenals—Are normal.

Pelvic Organs—Are normal.

MICROSCOPIC PATHOLOGY—

Brain—Basal surface of the left temporal lobe: The pia mater is greatly thickened, measuring on the average 1 mm. It consists largely of extensive deposits of fibrin and coagulated serum which have separated widely the few remaining connective tissue elements. In the interstices of the fibrin coagulum are numerous small, round cells and fibroblasts. These latter are especially abundant in the perivascular zones. There are areas of coagulum necrosis, affecting all elements, including the fibrous stroma and the infiltrating lymphocytes and marked by karyolysis and karyorrhexis. A few giant cells of the tubercular type are present in the exudate, usually with an ill-defined zone of small round cells. No typical tubercles are found in the layer of exudate, although the micropathologic picture is unmistakably that of tuberculosis. Underlying the exudate and firmly attached to the cortical substance of the brain are the miliary white nodules described under the Gross findings. Microscopically, these consist of fibrous tissue with poor vascularization infiltrated with small round cells, fibroblasts and an occasional giant cell of the tubercular type, with caseating center. The cortex adjacent to the invaded meninges is very edematous and shows some small, round-celled infiltration, especially perivascular. In some places it is definitely invaded by epitheloid cells and even small giant cells. The section from the region lamina cinera and optic chiasma show the same micropathology.

Left Lung—Lymph node at the hilus of the left lung shows microscopically, as in Gross, an advanced stage of caseation necrosis, no calcification. The adjacent lung parenchyma has been involved secondarily by direct extension of the ulcerating process. Nodules taken from six parts of the left lung (both lobes) and from two portions of the right lung show almost uniformly a bronchopneumonic process. The bronchi and bronchioles are filled with pus cells, erythrocytes and plugs of mucus and fibrin. The alveoli in the immediate vicinity of the bronchioles are also uniformly consolidated, being filled with pus and red cells. The capillaries of the alveolar walls are greatly congested. The walls are edematous and thickened. In other areas the alveoli are filled with coagulated serum and numerous pus cells, with a little fibrin and a few desquamated epithelial cells. There is some hemorrhage per diapedesis. The nodule from the basal part of the left lung shows a partially healed tuberculous condition. The central mass is caseated and structureless. It is well limited on almost all sides by a zone of fibrous induration, but at some areas there are yet evidences of semi-activity in areas of fibroblastic infiltration. All the parenchyma surrounding this healed tubercular focus is at present involved in the (late) bronchopneumonic process.

Aorta—The aorta is of normal structure. There are no atheromatous structures.

A CASE OF ERYSIPELAS TREATED WITH WHOLE BLOOD FROM CONVALESCENT PATIENT

BY ALBERT D. KAISER, M.D.

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Erysipelas has many supposed remedies which have all been seen to fail. It is hoped that by reporting this case the method applied here may be given further trial. Considerable has been done recently with whole blood in the treatment of severe scarlet fever, but I can find no reference to its use in erysipelas.

The patient, a doctor's child, was a girl six years old. Previous to her present illness she had always been well. Patient was vaccinated on left arm April 4th. A moderate positive reaction resulted, but two weeks after the inoculation a marked redness was noticed around the indolent vaccination wound. This area of redness and tenderness spread rapidly, accompanied by high fever and symptoms of toxemia. Attempts to check it early were made with the usual methods—antistreptoccus serum, leukocyte extract and so forth. They seemed to have no effect on the course of the disease. The child became extremely sick in a few days, refusing all food and appeared to be getting weaker daily. The infected area covered the entire left arm, chest, upper part of the abdomen and a small portion of the back. The streptococcus was obtained in culture. As the area was spreading and the child's condition becoming gradually worse a rather poor prognosis was given.

In an adjoining room was a nurse who was convalescing from a severe attack of erysipelas, involving the leg. Her temperature had been normal for five days and the streptococcus had also been grown in culture from her lesions. In view of the fact that recently certain infections had been treated with blood from convalescent patients with the same infection it was suggested by Dr. Roby to inject a small amount of whole blood from the convalescent case into the child. It was hoped in this way to secure some protective bodies which undoubtedly the donor must have to have made such a complete recovery.

Dr. Abraham Zingher, who has used this method of treatment in other infections, saw the case in consultation and approved of the transfusion. Seven ounces of blood were withdrawn from the nurse. The blood was citrated according to Zingher's method and injected into the muscles of the child. Within twelve hours the temperature had dropped to 100° and in twenty-four hours was normal and remained so thereafter except for a slight rise one evening. Coincident with the drop in temperature was a marked general improvement; redness and swelling disappeared and the tenderness and burning sensation were not noted twelve hours after the injection. The chart will indicate the complete and rapid recovery the patient made. The blood was injected into seven different muscles. Except for the initial pain from the needle there was no tenderness or discomfort from the injections. The recovery was complete in a very few days and it was with difficulty that the child could be kept in bed.

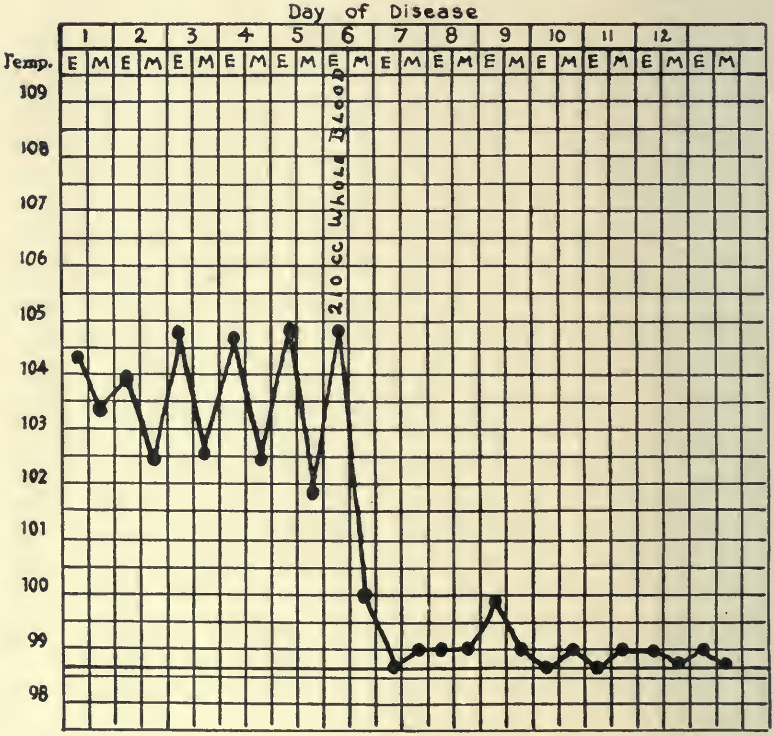

FIG. 1.—Temperature chart of case of erysipelas, showing marked drop in temperature, following injection of convalescent blood

CONCLUSIONS

(1) The well-known remedies for this infection were tried, but were unsuccessful, as they are generally reported to be.

(2) Whole blood taken from a patient who must of necessity have protective bodies against the streptococcus was used with apparently good success.

(3) It is urged in severe cases where the outcome looks dubious to use this method if a suitable donor can be obtained.

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ANALYSIS OF THYMUS EXTRACT ACTION—Rudolf Fischl (Monats. f. Kinderhk., 1914, Bd. XII., Nr. 8) has made a careful investigation of the action of thymus extract in dogs. He finds that the action of thymus extract is very variable. Its effect is shown by a coagulation of blood in the vessels of the nervous system. The same inconstancy is seen in other organic extracts. Vasomotor action is important in its effects on the nervous system. There are individual differences in reaction to the extract. No localization of the substance in the spinal cord is observed. The active substance is not in the thymus cells, the cell-free extract being often more active than emulsion of thymus elements. No embolic process is caused by coagulation. *In vitro* the extract acts as a preventive to coagulation. Specific extracts of other glands such as the suprarenals cause no effect on other nonspecific organs. Section of the vagus and the use of atropin has no influence on the action of the extract. Filtration through a Berkfeld filter stops the coagulation effect of the extract. Slow increase of dose causes tolerance to occur, and later much larger amounts can be taken without any bad effects. Anaphylaxis occurs after suspending the use of the extract. The coagulation intensity is variable, and low grades have no bad effect. Previous use of large doses of hirudin destroys the coagulation effect. Pulse is retarded, often irregular; seldom it is not at all influenced. Respiration becomes slow and deeper; occasionally it is irregular; sometimes it is not at all influenced. Terminal convulsions are probably due to anemia. Thrombosis of the vessels of the medulla as a cause of heart and respiratory changes is unlikely. Autopsy shows ecchymoses of the surface of the lungs in rare cases; they are small and result from the terminal convulsions. Changes in the suprarenals are not found.—*The American Journal of Obstetrics.*

THE WASSERMANN TEST IN CONGENITAL SYPHILIS

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That acquired syphilis is a prevalent disease, at least in large cities, is universally accepted. The statements of Fournier, Hutchinson and others, that about 12 per cent. of the population of their respective cities were syphilitic, has been doubted, considered too high an estimate, or, if accepted, only with the reservation that 12 per cent. in London, Paris or Berlin was no indication of its prevalence to a like extent in other communities. The advent of the Wassermann test has provided a means formerly lacking, by which the prevalence of syphilis may be ascertained, and many vagaries of the disease, before obscure, revealed.

Already sufficient statistics based on Wassermann tests have been submitted to indicate that 12 per cent. is a conservative estimate of the number of syphilitics in civilized urban communities, throughout Europe, America and Australia.

One of the significant revelations of recent investigations is the considerable number of persons having acquired syphilis who are totally ignorant of the fact, and many of them present symptoms and signs which do not suggest or lead to a correct or, at least, a complete clinical diagnosis.

At the Victoria Eye and Ear Hospital, an examination of 550 patients, irrespective of the disease or condition which had caused them to visit the institution, showed 13.3 per cent. syphilitic.[1]

An examination of 330 inmates of Wilhelmstift, Potsdam (an asylum for idiots), showed 15.4 per cent. syphilitic.[2]

Letulle, in an examination of 346 tuberculous patients, found a positive Wassermann reaction in 19 per cent. In this group only 10 out of 64 syphilitic patients were aware of the disease or had signs of it.[3]

The Wassermann test was positive in 3 per cent. of 1,000 consecutive new cases admitted to the medical out-patient department of the Pennsylvania Hospital. In 48 of these cases having a positive Wassermann reaction only 28 gave a history indicative of the disease.[4]

During the last five years, in a very limited field of observation, I have found the Wassermann test positive in 8 out of 100 private patients and 12 out of 215 hospital patients who had maladies of obscure origin, in which neither history nor signs were indicative of syphilis, and in which the subsequent course proved the correctness of the Wassermann findings. Of the private patients in this group 70 were females and 4 of them showed a positive Wassermann; of the hospital patients 51 were females and 7 of them showed a positive Wassermann.

In an examination of 100 obstetric cases, Piper found a positive reaction in 16.[5]

These findings suggest that a very prevalent idea, that the proportion of females syphilitic is much less than the proportion of males, may be wrong. They clearly indicate the desirability of a more extended application of the Wassermann test in the examination of patients.

Those tainted with congenital syphilis probably constitute the most important group afflicted with the disease. Here, again, the application of Wassermann and luetin tests, so far recorded indicate a more general employment of these methods of investigation and such a course may afford information that will so alter our ideas and methods of treatment as to preclude much mental and physical deterioration with its attendant misery and enormous financial losses.

Churchill, in an examination of 102 children in hospital, found 30 with a positive Wassermann.[6] Lucas found the Wassermann reaction positive in 13 per cent. of 111 children admitted to the Children's Hospital, Boston.[7] Boas and Thompsen report an instructive serological study of mothers and their infants: In a group of 17 mothers, with infants which showed no signs of syphilis and gave a negative Wassermann reaction throughout the first three months of life, 10 of the mothers gave a negative reaction and 7 a positive. Of a second group of 27 mothers, all having infants with clinical signs of syphilis and positive Wassermann reactions, only 11 mothers were aware of having had the disease. Of 35 mothers with syphilitic infants, 26 gave a positive Wassermann reaction and 9 a negative.

Of 20 infants that gave a positive Wassermann reaction at birth, 4 became negative in a short time and continued free from signs of the disease while under observation, from three to nine months. Of 27 infants having a negative Wassermann reaction at birth, 5 later became positive and 2 died who had had negative reactions and no clinical signs of syphilis, but presented typical lesions at postmortem.[13]

These observations confirm the view that a syphilitic mother may give birth to a healthy child; they apparently confirm the belief that a healthy mother may give birth to a syphilitic child; they strongly indicate that in the majority of cases, if either the mother or the child is syphilitic, the other is too.

The work of Boas, Thompsen and others proves that the Wassermann test is not as accurate during the first three months of life as it is later.

Cannata found the Wassermann reaction negative in 35, the luetin reaction negative in 17, of 51 syphilitic children under one year of age. He states that after the first year there is little, if any, discrepancy in Wassermann and luetin reactions, and that a larger proportion of syphilitics show a positive reaction.[8]

After reviewing the findings of various investigators, Noguchi concludes that the luetin test is positive in 70 per cent. of cases of congenital syphilis.[9]

It appears that during the first year of life the luetin test is preferable to the Wassermann test. I have had no experience with the luetin test applied to children under one year of age, but my experience with the Wassermann test applied to such children has been unsatisfactory. The Wassermann reaction was negative in all but one of 30 foundlings, under three months of age, examined at the Philadelphia Hospital. Several of the 29 that gave a negative reaction showed physical signs of the disease and improved under mercurial treatment; one at postmortem revealed typical syphilitic lesions.

Dr. R. C. Rosenberger, Director of Laboratories, and Miss W. McNitt, Assistant in Clinical Laboratory, Philadelphia General Hospital, in answer to an inquiry, state that during 1914 they examined 158 sera taken from the fetal end of the cord at birth, and obtained 27 positive and 2 doubtful Wassermann reactions. They examined serum from 66 children between nine months and eight years of age and obtained 8 positive and 2 doubtful reactions. The spinal fluid of 38 children was examined and 2 positive Wassermann reactions obtained.

During the time of these examinations there were about 238 cases in the maternity service and 1,000 children in the hospital. This apparently indicates that 11.34 per cent. of the children born in the institution during 1914 were syphilitic and that 1 per cent. of the children between nine months and eight years of age admitted to the hospital were syphilitic.

These serological examinations were only made in cases where clinical observation aroused suspicion that syphilis might be present; only a little more than half the children born in the hospital and less than a tenth of the older children were examined; it is therefore logical to suppose that somewhat more than 11 per cent. and 1 per cent. were syphilitic.

Later than the first year of life, patients having active congenital syphilis practically always give a moderately strong positive Wassermann reaction. I have observed 11 of these cases. One was a child five years of age referred for a serological examination on account of frequent, moderately severe gastrointestinal disturbance of unknown origin. The attending physician had treated this child's mother for acquired syphilis about seven years before her marriage; she had never shown any signs of syphilis after marriage, nor did her husband. The mother's Wassermann reaction was negative, the child's positive. Syphilitic treatment was instituted and the disturbance rapidly subsided and the child has enjoyed uninterrupted good health ever since, a period of more than two years. Another was a child thirteen years of age having an ununited, traumatic fracture of the leg; the family history was not procured. The Wassermann reaction was positive; antisyphilitic treatment apparently had no effect on the condition.

The other 9 cases were all referred for examination by ophthalmologists. They ranged from eight to fifteen years of age. None of them had any of the superficial signs of congenital syphilis. None of them had ever been suspected of having the disease until examined by the ophthalmologists. In every case both the mother and the father were living, in good health, and without obvious physical signs of syphilis.

When questioned by family physicians or ophthalmologists all these parents denied infection. One father admitted to me that he had contracted syphilis fourteen years before marriage and had received pill treatment for three months; he had never had any subsequent signs of the disease but gave a weak positive Wassermann reaction. Another father admitted to me having contracted infection five years before marriage. He immediately submitted to treatment and received a very thorough course of inunctions, hypodermics and pill treatment extending over two and a half years, after which he was pronounced cured. He never had any subsequent signs of the disease, no illness whatever, and his serum examined at intervals of several months has given a negative Wassermann reaction three times. His child was twelve years old when examined and gave a positive reaction.

Nearly half these children had suffered unduly frequent attacks of illness of obscure origin and were generally considered "delicate." They had many times been under a physician's care prior to visiting an ophthalmologist.

It would almost seem that congenital syphilis, in those who survive ten or more years, is quite as apt to be occult as obvious; that without serological examinations nearly all of these occult cases remain unrecognized, unless vision is impaired and the ophthalmoscope applied.

It has long been known that congenital syphilis may remain latent through childhood, then suddenly impair or destroy vision or hearing, or submerge the victim in insanity. Such occurrences are comparatively rare. Of great importance to the welfare of the community are the numerous cases of congenital syphilis in which the disease impairs to a moderate degree the general vitality of the victim and subjects him to frequent attacks of illness which minimize his productive or earning power and increase the community tax. How numerous these cases are cannot be known until all such persons are given the benefit of a serological examination. That they are numerous seems very probable from the small amount of investigation already reported.

The discovery of such an individual in a family should be a strong appeal for a serological investigation of the entire family; the information so obtained will often preclude what would otherwise be inevitable misery or catastrophe. This is illustrated by Gilmore and Pollock in the following family history: Father afflicted with locomotor ataxia, mother always enjoyed good health, never presented any signs of syphilis. The oldest child was apparently normal until seven years of age, was then afflicted with disease of the eye which impaired vision; when ten years of age became blind and mentally affected, cause —congenital syphilis.

Second child apparently normal until seven years old, then afflicted with disease of the eye, cause—congenital syphilis. Both these children gave positive Wassermann reactions.

Third and fourth children, six and five years of age, both apparently healthy and gave negative Wassermann reactions.[2]

I have observed two families with somewhat similar histories.

Boas reports a family with the following family history: Mother entered hospital with early signs of syphilis in 1891 and received treatment for two years; since then she has always enjoyed good health and never presented signs of syphilis. In 1894 she married. Her husband has never had signs of syphilis and when examined gave a negative Wassermann reaction. This woman has given birth to 12 children, they are all living and all have congenital syphilis.[10]

Wolf[11] has studied a number of families in which syphilitic parents gave birth to syphilitic children, and then, after recovery, the same parents gave birth to non-syphilitic children.

During the time these parents were syphilitic about half the pregnancies resulted in the birth of living children; half of those lived to adult life and only two of them were normal.

The children born at a later period and not afflicted with congenital syphilis were all normal.

CONCLUSION

The preponderance of evidence harmonizes with the citations in this article and clearly indicates a professional obligation to make serological and luetin examinations of all hospital patients until it is conclusively proven that such a course is, or is not, economically profitable to the state.

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A CASE OF INFECTIOUS PURPURA

BY PHILIP S. POTTER, A.B., M.D.

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Maurice McG., born June 11, 1904, age ten years. Occupation of father, farmer. History, negative. Mother, thirty-three years of age, had pleurisy three times. Past year she has been losing weight slowly and has had a failing appetite. Never had any miscarriages. Labor was full term and normal. The child was nursed one month, then put on a modified milk diet and did very well. Now has a general adult diet, except he will not take vegetables. Birth weight, 11¼ pounds; present weight, 81 pounds.

The boy has always been strong and healthy, his first illness being last August, when he had what his mother said was dysentery, the rest of the family at the same time being affected. Was sick with this one week. Last September there was an epidemic of typhoid in the town. He, with the rest of the school children, received typhoid vaccine.

On November 10th, during play, he caught his toe in the rug and fell, striking his head over the right temple. Three days after this he had a second fall, hitting his head against the oven door. This was followed by a large hematoma, which was reduced by his physician.

During the period between falls, while roaming around the house, the boy found in the attic some little tin disks used for tacking on tar-paper. These had been in the house for about twelve years. He had them almost constantly in his mouth, trying to make whistles out of them. He would keep them in his pocket, transfer them to his mouth, then back to his pocket, and so on.

Three days after this he began to complain of sore throat. That night, at supper, he ate heartily of potato soup. About one o'clock the next morning he vomited. The vomitus was large in amount and of a sour odor. His mother gave him two doses of castor oil. The result consisted of constipated particles, together with which, according to the father, there appeared something which looked like pus. Calomel was given. Had a good movement, together with a slight amount of bright blood. The following day he complained of cramps low down in the abdomen. His physician prescribed a cathartic, and after a period of two days succeeded in getting a good bowel movement, the stool being very hard and black.

During this time there was about one vomiting spell a day, and the boy had to be coaxed to eat, until, finally, after about a week, he began to take more nourishment. Three days after the last vomiting the mother noticed he was slightly jaundiced and very drowsy. After a good bowel movement the icterus disappeared and the boy brightened up considerably and seemed to be getting along well, until three days before admittance to the hospital, December 11th, when his physician noticed his mouth to be filled with apthæ, also small darkish white spots along the inner side of the gums along the margin of the teeth. The teeth became loosened and gums in places about the teeth dark and soft. The breath was bad and there was salivation. The right tonsil was covered with a white patch. Petechial spots appeared on the lips and tongue about the same time. Temperature, 99°F.

These spots were touched with solid silver nitrate and cleaned up in two days, except that on the tonsil. During this time the eyes became weak, lasting for ten days. There was double vision for two days.

Two weeks ago he complained of pain in the left cheek, which was intermittent in character. One week ago, had considerable headache, followed by a profuse nosebleed, which seemed to relieve it.

December 9th, began to bleed from the tonsil. The next day, at dinner time, the boy said his dinner did not taste good, and suddenly had a large bloody emesis. The same thing happened at supper time. It consisted of a large quantity of undigested food, with clotted blood, black and foul smelling. On examination his physician found the right tonsil gangrenous and involving the pillars. This was cauterized.

The next day, toward evening, he was brought to the city for an examination by a laryngologist. On his way over his parents said he vomited about a pint of blood. He was admitted to the children's ward of the Hospital of the Good Shepherd at 7:30 P.M., shortly following which he had another large bloody emesis.

Examination showed a fairly well-nourished boy of a lemon-yellow color. He was keen in his replies and his movements did not seem so weak as one would expect from his color and loss of blood. His pulse was 120, good volume, regular and steady; respiration, 24; temperature by mouth, 98.6°F.

Over his right eye was a large black and blue mark, which seemed to be fading out. On the abdomen and chest a few petechial spots. On the left arm at the insertion of the biceps was a large fading hemorrhagic spot, where his sister had grabbed him in play two weeks before. This was about the size of an adult's hand. On the anterior surface of each of the legs over the tibiæ were two scars, dry and scaly. This was where he had bumped himself when he fell. They were not hemorrhagic. The eyes were clear. There was slight puffiness under the eyes and the whole face appeared slightly edematous. All reflexes were normal. Breath was very foul, teeth good and not loose, gums contracted and very pale, joints negative, as were the lungs and heart. The abdomen was soft and below the level of the thorax. Liver not enlarged, spleen palpable.

The lower lip showed numerous spots which had been touched with silver nitrate. The tongue was clean, the pharynx dotted all over with small pin-head bright hemorrhagic spots. The right tonsil showed the whole surface covered with an ulcerated area, which had extended into the pillars, and covered by a large blood clot. Hemoglobin (Talquist) by lamplight, 65 per cent.

December 12th. Was very restless, complained of pain in the left side of the face. During the day several bloody emeses; once, also, bleeding from mouth and throat. Toward evening numbness in the eyes and pain in the left knee. Patient very weak and the face very pinched.

The urine was very bloody, alkaline, 1.022; 31 per cent. albumin. Lowest temperature, 99.2°; highest, 100°.

Blood: Hemoglobin, 55 per cent.; whites, 4,100; polynuclears, 78 per cent.; eosinophiles, 6 per cent.; basophiles, 2 per cent.; lymphocytes, 18 per cent.; reds, 1,600,000, variation in size, uneven staining, some poikilocytosis and an occasional nucleated cell. Blood culture taken.

December 13th. Emesis same character as the day before, breath foul, pains in both knee-joints, bleeding from mucous surfaces of mouth, nose and throat. Very constipated. An enema resulted in a large, formed, black stool. Lowest temperature, 98.4°F.; highest, 101.6°F. Urine still bloody. Hemoglobin (T), 15 per cent.

In the afternoon hypodermoclysis normal saline, 250 c.c. That night a slight spasm, muscles of body rigid, and eyes twitched. Widal negative. Culture of throat reported streptococcus, staphylococcus, a fusiform bacillus and a spirillum.

December 14th. Report on blood culture, streptococci. In the morning very restless, moaning and crying out now and then, but says he is not in pain. Bleeding from all the mucous membranes continues. Urine very bloody, 1.012; 31 per cent. albumin. Transfusion performed at 11:45 A.M., by Dr. E. J. Van Duyn, the father acting as donor, from radial artery to jugular vein, the blood being allowed to flow seventeen minutes. At 2:00 P.M. there was a dark brown liquid stool and two large sloughs were expectorated. The boy is very hungry and there is good color in the cheeks and he is very bright. Urine clear and amber in color.

Blood: Hemoglobin (Talquist), 65 per cent.; reds, 3,624,000.

December 15th. Had an excellent night and says he feels fine. Throat bright-red with a few small white patches on pharynx and tonsils; one on top of uvula. Culture: Streptococcus, staphylococcus, fusiform and spirillum. No odor to breath. Lowest temperature, 98.2°F.; highest, 100°F.; lowest pulse, 84; highest, 104; respirations, 20. Urine clear, amber.

Blood: Hemoglobin (Dare), 46 per cent.; reds, 3,680,000, irregular, some having the appearance of undergoing hemolysis; whites, 4,000. Differential: Polynuclears, 90½ per cent.; small lymphocytes, 4 per cent.; large, 5 per cent.

3 P.M., slight epistaxis.

December 16th. While in a fairly good condition, does not seem so bright as yesterday; color not so good. Slough appearing again in the tonsils. Constipated. Urine light in color, alkaline, 1.010, albumin negative.

Blood: Hemoglobin (Dare), 58 per cent.; reds, 3,176,000, variations in size, shape and color, some mitosis; whites, 3,000. Differential: Neutrophiles, 86 per cent.; eosinophiles, 1 per cent.; lymphocytes, 23 per cent.

December 17th. Not so bright as yesterday, more odor to breath and more restless; color seems to be fading out. Petechial spots are now beginning to appear on lips, tongue and body. Slight epistaxis several times during the day and night. Loud, dry cough, but not very frequent. Lungs clear. Urine clear.

Blood: Hemoglobin (Dare), 40 per cent.; reds, 3,216,000; whites, 2,200.

December 18th. Extremely restless and complains of headache. Epistaxis during the night and next afternoon. Is somewhat nauseated. Large dark emesis, followed by extreme pallor and very foul breath. Stools black. The cough continues and the boy complains of pain in the abdomen. Urine tinged with red.

Blood: Hemoglobin (Dare), 24 per cent.; reds, 2,584,000, marked variation in size, shape and color, and a decided hemolysis taking place. Whites: Polynuclears, 85 per cent.; eosinophiles, 3 per cent.; lymphocytes, 12 per cent. Patient seems very weak and the pulse is becoming irregular. Antistreptoccoccus serum (20 c.c.) given intravenously.

December 19th. Vomited once, right after eating, projectile in type. Color of skin ashy. Slight epistaxis during the day and night, also a large bloody emesis that evening. Complains of a sharp pain in the head. Lowest temperature, 99.8°F.; highest, 101.8°F.; pulse, 132; respirations, 24. Urine clear.

Blood: Hemoglobin (Dare), 17 per cent.; reds, 1,400,000; whites, 2,600.

December 20th. Much brighter, mucous membrane of throat blanched and clear, except one small patch on uvula. Eyes very sensitive to light. Urine still clear; stool dark and soft. Temperature, 99.6°.

Blood: Hemoglobin (Dare), 22 per cent.; reds, 992,000; whites, 2,100.

December 21st. Hemoglobin (Dare), 24 per cent.; reds, 1,096,000; whites, 2,200. Hungry. Stools yellow for the first time and he seems stronger and to have more vim; color better; throat and urine clear. It was now decided to give him another transfusion, but it seemed impossible to find another donor.

December 22d. Hemoglobin (Dare), 25 per cent.; reds, 1,336,000; whites, 2,000.

December 23d. Hemoglobin (Dare), 26 per cent.; reds, 1,288,000; whites, 2,500. Differential: Neutrophiles, 84 per cent.; eosinophiles, 3 per cent.; basophiles, 1 per cent.; lymphocytes, 12 per cent.

December 24th. Urine, 72 ounces. Hemoglobin, (Dare), 24 per cent.; reds, 1,512,000; whites, 2,100.

December 25th. Had a good day and enjoyed his Christmas dinner.

December 26th. Blood culture negative. Urine 43 ounces.

December 27th. Hemoglobin (Dare), 33 per cent.; reds, 1,640,000; whites, 2,100. Urine 72 ounces.

December 29th. Temperature rose to 103° and the patient complained of pain in the right arm, and in the afternoon had a large emesis, not bloody. The eyes became sensitive to light. There was puffiness under the eyes and slight edema of the face and the abdomen became distended. A red rash now appeared on the face and soon became distributed all over the body. At first it looked like a measles rash, but did not quite bear all the earmarks of measles. There had been no measles in the hospital, nor had anyone been near him who had been in contact with measles. There was a slight cough, hard and dry.

December 30th. The cough continued and the boy had a few slight chills. Blood: Hemoglobin (Dare), 26 per cent.; reds, 1,560,000; whites, 800. Temperature, 105°F., and patient nauseated.

January 2, 1915. Very much worse. Is unconscious and has a low muttering delirium. The rash is disappearing on the face and extremities. On the chest it is swollen, pin-point and bright red. On the back all over it is purple to black and hemorrhagic. Bowels loose but of good color. The tongue is dry and heavily coated and bleeds readily to touch.

January 3d. Patient still unconscious; very weak. Temperature still 105°. Bowels loose and colored bright red. Large liquid emesis, in which was a piece of brown straw, 1½ inches long, one-half of which was covered with thick mucus. This was still fairly brittle.

The boy's father said he was in the habit, while playing in the barn, of having a piece of this straw in his mouth. The question came up at this time if a piece of straw could remain in the stomach this long without becoming softened. A piece was put in a weak solution of HCl and kept in the incubator for a little over two weeks. At the end of this time there was hardly any change.

At 4 P.M. the patient had another vomiting spell, following which he succumbed. No autopsy.

Physicians' Building, 608 East Genesee Street.

SOCIETY REPORT

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS

Stated Meeting, Held March 11, 1915

WALTER LESTER CARR, M.D., CHAIRMAN

A SIMPLE SYRINGE METHOD FOR THE TRANSFUSION OF CITRATED BLOOD IN CHILDREN

DR. ABRAHAM ZINGHER demonstrated his method of transfusing citrated blood in children. He said that citrated blood in human transfusions was first practised in 1914 by Hustin, who injected in one instance a mixture of citrated blood and glucose. In December, 1914, Dr. R. Weil recommended the use of 1 per cent. sodium citrate. R. Lewisohn found that 0.2 per cent. sodium citrate would keep the blood fluid, and used that concentration successfully in a few human transfusions at Mount Sinai Hospital. The main part of the outfit consisted of two Record syringes, one 30 c.c. and one 10 c.c.; a platinum iridium or steel needle, 1½ inches long, No. 18 B. & S. gauge, with which the blood was obtained from the donor; a Goldenberg salvarsan needle for transfusing the blood into the patient; sterilized bottles for collecting the blood from the donor; a number of beakers for containing solutions of 10 per cent. and 1 per cent. sterile solutions of sodium citrate. Into each of several 100 c.c. bottles was placed 2.5 c.c. of the 10 per cent. solution of sodium citrate. A 1 per cent. solution was ready for rinsing out the syringe. After applying the tourniquet to the donor, the needle attached to the large Record syringe was inserted into the tense median cephalic vein and a syringe full of blood quickly aspirated. The operator quickly detached the syringe and emptied the blood into one of the 100 c.c. bottles. The assistant kept the needle free of blood by attaching the smaller syringe and injecting a few drops of 1 per cent. solution of sodium citrate. Several syringefuls of blood could be obtained before it was necessary to rinse out the syringe with the 1 per cent. solution of sodium citrate. Seventy-five c.c. of blood were put into each 100 c.c. bottle, making the final dilution of sodium citrate 0.33 per cent. With each addition of blood the contents of the bottle must be rapidly shaken that the citrate might come into intimate contact with each amount of blood added. The blood was then aspirated from the bottles by a pipette and collected into a large beaker immersed in warm water to keep the contents at body temperature. The best vein for making the injection was usually the median cephalic. The next choice was the median basilic, or the external jugular. In older children the needle could be inserted through the skin directly into the vein. In very young children, and especially in infants, it was preferable and even necessary to expose the vein by a small incision. By exposing the vein one was certain that the needle for the transfusion was properly entering the vein, where it could be secured by a catgut or silk ligature. It was important not to overburden the patient's circulation with a relatively large amount of blood and it was therefore advisable not to inject more than 1 to 2½ ounces of blood in infants up to six months of age; 3 to 4 ounces up to one year, and 4 to 6 ounces up to two or three years of age. Where one desired to use non-citrated blood the technique could be followed along very similar lines, though two assistants were needed.

The ease and simplicity of this method recommended it in a variety of medical and surgical conditions. The advantages claimed for the method were its simplicity, the rapidity with which the blood was obtained and citrated in several small containers, the complete control over the rapidity of the injection of the blood and the amount of blood injected, and the applicability of the method, even to very young infants.

They had performed 12 transfusions by this method on young children at the Willard Parker Hospital, and one on a seven-weeks-old infant, in which the median cephalic vein was used.

It was of course requisite that a donor free from tuberculosis and syphilis be chosen and that the serum of the donor should not agglutinate or hemolyze the patient's red blood cells, or vice versa.

DR. WILLIAM H. PARK said he wished to say that he had seen Dr. Zingher perform the removal and injection of blood by this method and everything went smoothly and quickly. The method was easy to master and suitable for those who wished to inject blood in young children.

THE PATHOLOGY OF TUBERCULOSIS IN CHILDREN

Dr. F. H. Bartlett read this paper. He presented an analysis of 178 autopsies, at the Babies' Hospital, New York City, in which tuberculous lesions were found. A study of the earlier records of the hospital showed 16.4 per cent. tuberculous cases among 1,131 autopsies. The contrast with adult percentages was very striking, whether one accepted Lubarsch's figures, 69.2 per cent., or those of Naegeli, 93.1 per cent., as the average. The age incidence of this series varied from two and one-half months to five years, 75 per cent. of the subjects being under two years of age. It was interesting to note that in only 5 cases was the tuberculosis limited to the bronchial lymph nodes alone, and in only 1 to the mesenteric lymph nodes alone. The writer concluded that in children the primary infection of the lung was the usual mode of infection, since 82 per cent. of their cases were of this type. The absence of tuberculous lesions in the lungs in 14 cases and the presence of such lesions in the bronchial lymph nodes in 7 of these seemed to show that it was possible for the tubercle bacilli to pass through the lungs without localizing there. The largest number of cases were of inhalation origin, as shown by the large percentage of cases in which the pulmonary lesions were the most advanced in the body. The marked tendency to rapid and general dissemination of tuberculous lesions in young infants under one year of age was well shown. In view of this fact the survival of any young infant infected with tuberculosis for more than six months after infection was very remote, while healing of tuberculous lesions in young infants was practically out of the question. In the entire series not a single healed tuberculous lesion was found, and attempts at healing as shown by calcified areas were observed in only five instances in the lungs and thirteen times in the lymph nodes. Only twice was it found in infants less than a year old, and in both these cases the extensive generalization of the tubercles throughout the body gave evidence that the small calcareous areas present did not prevent spreading of the infection. Encapsulation of a tuberculous lesion was not encountered in this series of cases. The predominance of respiratory over deglutition infection was indirect evidence of the quality of the milk supply, though it should not be forgotten that children might carry tubercle bacilli into their mouths by their fingers infected from other sources than their food. The comparative frequency of tuberculous meningitis in young infants was noteworthy as evidence of the very general dissemination of tuberculous lesions in young subjects. In this series of 178 cases the meninges were found to be involved in 96 instances. The younger the infant the greater was the liability to meningeal involvement, or indeed to all forms of dissemination. One infant, two and one-half months of age, was found to have ten viscera involved in the tuberculous process. There was a smaller proportion of cases of tuberculous meningitis among children who acquired the disease by ingestion than among those who acquired it by inhalation, and this was in keeping with the fact that the cases infected through ingestion showed rather less tendency to generalization than did the respiratory cases. In the infant, tuberculous meningitis was a miliary tuberculosis and tuberculosis of the lungs was a miliary tuberculosis.

THE TRANSMISSION OF TUBERCULOSIS

DR. WILLIAM H. PARK read this paper. (See page 485.)

THE CARE OF THE TUBERCULOUS CHILD

DR. I. OGDEN WOODRUFF read this paper. (See page 490.)

THE RECOGNITION OF THE FACT AND THE ESTIMATION OF THE DANGER OF BOVINE TUBERCULOSIS

DR. HENRY L. COIT, of Newark, read this paper, in which he said that personally he had had no experience with bovine tuberculosis, having never met with a case. This was perhaps largely due to the exceptional purity of the milk supply in his locality, though it might also be because the tests had not been ample enough. After reviewing some of the opinions bearing on the subject, Dr. Coit concluded that they had to acknowledge that to just what extent bovine tuberculosis was dangerous to human beings had not yet been determined. From the information that he had been able to obtain it seemed that herds of New York were the guilty ones in respect to tuberculosis infection rather than those of New Jersey. The introduction of infection into a herd sometimes occurred when new stock were purchased. It seemed that dealers sometimes "plugged" their cattle with tuberculin before selling them, so that they did not react to the tuberculin test. To avoid the danger from this source it should be made compulsory to brand every animal that reacted to the test. It was also desirable that owners of dairy farms should breed their own cattle for replenishing their stock. The Government spent many thousands of dollars each year making tuberculin tests for private individuals and yet had refused to coöperate with the Milk Commission, entirely failing to appreciate that by coöperation far better results could be obtained at a much reduced expenditure. Dr. Coit reviewed the investigations made in New York City by Dr. Hess and in England by Dr. Anderson with reference to the incidence of bovine tuberculosis among children using ordinary uncertified milk. The results of their observations seemed to show that the danger of infection with bovine infection was very slight, though they were all agreed that it might occur. The speaker urged members of the Milk Commission and other organizations interested in a pure milk supply to take a more active interest in the work and recommended that for the purpose of making tuberculin tests only veterinarians having the standing of a professor in a veterinary college be employed.

DISCUSSION OF SYMPOSIUM ON TUBERCULOSIS

Dr. L. Emmett Holt said he was interested in what Dr. Coit had said regarding the prevention of tuberculosis among cattle. That contact played an important part in the dissemination of the disease was even more true of cattle than of human beings, as contact was closer. Dr. Coit had spoken of the cows that were "plugged" with tuberculin by dealers when they were sold. Under existing circumstances it seemed almost impossible to keep tuberculosis out of a herd so long as dairymen continued to introduce new animals into the herd at frequent intervals. In this connection the importance of dairy farms breeding their own cattle for the purpose of replenishing their herds should be emphasized. This was especially important in view of the fact that cows were so often tuberculous though appearing to be in good condition. This was also true of many children with tuberculous lesions; if digestion and assimilation were good, they might steadily gain in weight, while at the same time the disease might be progressive. Dr. Holt asked Dr. Woodruff to tell them what was the relative success obtained in New York with the open air and open window classes.

Dr. R. Langley Porter, of San Francisco, Cal., said that such a discussion as this should not take place without attention being called to the fact that there were conditions in which there were non-tuberculous lesions of the lungs in young children. It was interesting in connection with what had been said of bovine tuberculosis to observe that in California it was said that 33 per cent. of the cattle were tuberculous, yet there the cattle were not housed as in the East, but lived in the open, and yet infection took place as readily as when the cattle were kept in stables. In spite of the large percentage of infected cattle there was no correspondingly large percentage of infections.

Dr. Porter called attention to the fact that there were conditions in which there were non-tuberculous lesions of the lungs in young children and that the subject should not be discussed without taking this fact into consideration. In connection with what had been said regarding bovine tuberculosis, it was interesting to observe that in the State of California it was said that 33 per cent. of the cattle had tuberculosis, and here the cattle were not housed as in the East, but lived in the open and yet infection took place as readily as when the cattle were kept in stables. In spite of this large proportion of tuberculous cattle there was no correspondingly large proportion of tuberculous infections among children under fourteen years of age (the estimate being 7 to 9 per cent. bovine), and he felt that the great danger was in transmission from one human being to another human being.

It seemed to him that there were two things to be impressed. First, the necessity of minimizing the danger of infection through human contact, and especially from the carriers so often found in the home. Such carriers were frequently the grandparents, who, complaining of asthma or winter cold, etc., nearly always had tuberculosis. The second point to be emphasized was that they should not assume a child to be tuberculous when that was not the case, as there were so many non-tuberculous lung infections.

Dr. Charles R. L. Putnam said, in response to a request to speak on bone and joint tuberculosis, that he did not have much to say on that subject, but he wished to speak of mesenteric tuberculosis. They had for years in all abdominal cases in children examined the mesenteric glands to find how common it was relatively in the mesenteric lymph nodes and the lungs. The lungs might be badly affected and yet the child be free from tuberculous peritonitis and this apparently showed that the tubercle bacilli could enter and pass through the mesenteric glands without producing permanent lesions of the mesentery or intestine. The infection might be transmitted to the meninges and yet the peritoneum not be affected.

Dr. Putnam asked whether the tuberculin test detected both human and bovine tuberculosis when applied to cattle.

Dr. Maurice Fishberg said that he was surprised that in a discussion on bovine tuberculosis in children the problems of immunity were not touched upon. Recent experimental investigations had shown conclusively that reinfection was difficult or even impossible in tuberculosis. Clinically it appeared that the human being was also immune to reinfection with the tubercle bacilli. This was evident from the fact that physicians, nurses and orderlies in hospitals for consumptives had never been known to be infected with the disease; similarly marital infection was a negligible factor in the dissemination of phthisis. The reason for this curious phenomenon was that everybody had been infected with tuberculosis before reaching adolescence, immaterial whether phthisis developed or not. Dr. Fishberg pointed out that in children between the ages of three and twelve years pulmonary tuberculosis of the types seen in adults was very rare. Authorities were in agreement on this subject. Tracheobronchial adenitis was quite common at this period, but this was not phthisis. It had recently been suggested that tuberculosis in children, especially of the glands, was due in a large proportion of cases to the bovine type of tubercle bacilli and that this bovine infection was not followed by phthisis immediately or in later life. Indeed, some had ventured to assert that bovine infection during the first decennium of life was an important immunizing agent, preventing reinfection with bacilli of the human type. This was a fascinating subject and sufficiently important for investigation. He suggested that Dr. Park, who had facilities and opportunities, should undertake it.

Dr. Henry L. Coit said Dr. Bartlett's statement that the large proportion of infections among the 178 cases studied at the Babies' Hospital seemed to be due to inhalation, since the lesions in the lungs seemed to be the primary was interesting in contrast to the belief that tuberculosis in infants was due to infection through ingestion of the bacilli, as when the tuberculous mother handled the child and the breast with her soiled fingers. This question whether the tubercle bacilli were introduced through the lung or through the intestine ought to be cleared up. Revenel fed a cat tubercle bacilli and produced infiltration of the bronchial lymph nodes, so it seemed that the bacilli could pass through the intestines and mesentery without producing changes in these tissues and yet be swept through the blood and lymph channels to the lungs, there to do damage. It had always been his impression that infection occurred by ingestion oftener than by inhalation.

Dr. F. H. Bartlett said, in reference to the inhalation and ingestion origin of tuberculosis, that after finding the primary lesion in the lungs and bronchial lymph nodes in 134 of the 178 cases it would be a far cry to assume that the bacilli passed through the intestines to the bronchi. They had found the primary lesion in the mesenteric lymph nodes in only 17 instances and it seemed fair to attribute these to ingestion. The difficulty lay in proving positively which focus was the oldest tuberculous lesion. But assuming that in 134 cases this was in the lungs and bronchial lymph glands, he believed the bacilli gained entrance there by inhalation rather than by ingestion. From the statement of the case it seemed evident that the inhalation origin was the most common mode of infection.

Dr. William H. Park, in closing the discussion, said he was surprised at Dr. Fishberg's statement in reference to marital infection with tuberculosis. Several investigators of this subject had found reason to believe that infection did at times take place. It seemed that they all must have seen instances in which one member of a family after another had returned home to take care of those of their number suffering from tuberculosis, and had become infected. It might, of course, be argued that the care and mental depression attendant on such an experience might bring out an early infection that had been dormant. He thought Dr. Coit was extreme in his requirement that only those of the standing of a professor in veterinary medicine should be permitted to take temperatures; the physician was in the habit of allowing the trained nurse to take temperatures. Of course the men who took the temperatures should be well trained and honest.

As to the relative amount of bovine and human infection, while it had been proven that bovine bacilli did infect infants and children, yet it seemed equally clear that the great majority of infections in man were transmitted from one human being to another. In cases of bovine infection in which there was a general tuberculosis there was, as a rule, no way of determining the type of bacilli causing the lesions; the bovine type was exactly like the human in extent and origin.

As to the question whether the tuberculin test detected both human and bovine tuberculosis in cattle, the tuberculin test would reveal either type of infection, but as a matter of fact one never found human tuberculosis in cattle unless the cattle were experimentally inoculated with the human tubercle bacilli.

DR. HENRY L. COIT said that he had it from a veterinary practitioner that the rank and file of veterinarians were not high grade in ability or reliability. Still they had been employed to make inspections and apply the tuberculin test. He believed that as a proper safeguard to the milk supply they should employ men of the grade of professor in a veterinary school that they might make sure of having men of ability, character and reliability.

DR. I. OGDEN WOODRUFF, in closing the discussion, said that as to the relative value of the open air and open window classes, he though it was a question of climate and equipment and of the amount of money that could be expended on equipment. In New York the open-window classes were conducted in rooms in which the windows were pivoted on two sides and the air was practically the same as the outside air, or just enough heat was provided to give a temperature of 40°F. In his opinion this arrangement had certain advantages over the open-air classes. The excessive humidity and high winds in this climate took a large amount of bodily heat and some protection from the high winds was an advantage unless the children were all equipped with warm clothing. With the present equipment provided by the city the children were too cold out of doors. In some private schools the children were entirely out doors and seemed to do well, but here they were better protected against the cold by warm clothing. Another point had to be considered in the open-air class and that was proper protection from the sun. The roof should be double or so constructed that it would give adequate protection against the sun in the summer. The open-air plan was apt to prove too cold in winter and too hot in summer, and with the present equipment he preferred the open-window plan.

DEPARTMENT OF ABSTRACTS

Original Condensations of Current Pediatric Literature by the Editors and the Following Associates

T. Wood Clarke	Utica, N. Y.
Coleman W. Cutler	New York City
Charles E. Farr	New York City
Morris Friedson	New York City
Gaylord W. Graves	New York City
Jerome S. Leopold	New York City
William Lyon	Jackson, Mich.
Stafford McLean	New York City
Carlo D. Martinetti	Orange, N. J.
Raymond B. Mixsell	Pasadena, Cal.
Rudolph D. Moffett	New York City
Willard S. Parker	Boston, Mass.
Mark S. Reuben	New York City
Mills Sturtevant	New York City
Samuel W. Thurber	New York City
Eugene F. Warner	St. Paul, Minn.
Edwin T. Wyman	Boston, Mass.
J. Herbert Young	Newton, Mass.

McNeil, Charles: On the Value of Emulsions of Liquid Paraffin and Castor Oil in the Treatment of Certain Types of Chronic Dyspepsia in Childhood. (Edinburgh Medical Journal, February, 1915, p. 100.)

This article is based upon the records of about 120 cases observed in the out-patient department of the Children's Hospital of Edinburgh. An emulsion of liquid paraffin was used in the following prescription: Paraff. liq., ʒiij; Gum acac., ʒiij; Gum tragacanth, gr. xij; Ol. cass., ♏viij; Aq. destill., ad ʒvj.; Sig., ʒj, t. i. d. p. c. The emulsion of castor oil was prepared as follows: Ol. ric., ʒijss; Gum acac., ʒvj; Aq. aurant, ʒv; Aq. cinnam., ad ʒvj.; Sig., ʒj, t. i. d. p. c.

Either the emulsion of liquid paraffin or the emulsion of castor oil was administered and in some cases in combination with calomel, bicarbonate of soda and salicylate of soda, or with calomel, powdered rhubarb and carbonate of magnesia. The types of disease in which these emulsions were used consisted of a group of cases of malnutrition with chronic diarrhea, some cases of enuresis, recurrent vomiting, recurrent attacks of fainting or sudden pallor, and cases of urticaria and eczema. All these varied conditions the author believes are due to some unhealthy condition of the intestinal mucous membrane. The action of the liquid paraffin and castor oil is an entirely local one on the lining of the digestive tract and this action is accomplished by soothing congestion of the blood vessels.

The conclusions are as follows: Emulsions of liquid paraffin or of castor oil in small non-purgative doses are of great value in the treatment of various and apparently distinct types of chronic dyspepsia in childhood. In a great majority of these diverse types of illness there is an abnormal condition of the stools; this may often be a true diarrhea, but not seldom also merely a too soft consistence of the stool with or without the presence of mucus. In the series, constipation was present in only a small majority. A large number of these cases have followed the common infectious fevers of childhood, especially measles and whooping-cough. The action of liquid paraffin and castor oil used as described is similar. It is entirely local in its action. R. B. M.

MOSCHCOWITZ, A. V., PIGMENTED ODONTOMA OF THE UPPER JAW. (Annals of Surgery, March, 1915, p. 353.)

A swelling was first noticed in the right upper jaw of the infant at six weeks of age. This was incised twice and a rudimentary tooth removed. The swelling increased to the size of an English walnut and bled freely at every touch. A section was removed and examined. It proved to be a pigmented odontoma. Because of the age of the infant the use of the X-ray was advised but no benefit obtained. Moschcowitz is now considering extirpation of the tumor with the knife or the thermo-cautery. This is probably a malignant tumor. They are of two sorts—hard or crown odontoma, made up of dentine or cement substance, and soft or pulp growths, including periodontium.

C. E. F.

KNOX, JR., J. H. M., AND FORD, W. W.: NOTE ON THE OCCURRENCE OF BACTERIUM WELCHII (BACILLUS AEROGENES CAPSULATUS) IN THE DEJECTA OF CHILDREN. (Johns Hopkins Hospital Bulletin, January, 1915, p. 27.)

This investigation had its origin in the work of Herter, who maintained that the "gas bacillus" is a causative factor in pernicious anemia and is more abundant in the dejecta of those suffering from this disease than in normal individuals. As a result of the "gas bacillus" there is an abnormal putrefaction in the intestines. More recently Kendall and his co-workers have advocated the rôle of the "gas bacillus" in the causation of certain types of summer diarrhea in children where there seems to be chemical evidence of extensive putrefactive decomposition.

In view of these observations by Herter and Kendall it was a point of some importance to determine just how frequently the "gas bacillus" can be isolated from normal individuals. Knox and Ford, therefore, made an examination of the dejecta of a number of children in the Harriet Lane Home to determine this point. These children varied in age from two to twelve years and were admitted to the Home for a variety of ailments. In no case, however, was there any evidence of dysentery, and the cases can be properly classified as normal in so far as the intestinal tract was concerned. At the same time the stools of several babies in the obstetrical ward were also examined. The classical method in vogue for the isolation of the organisms were employed in all instances. In 18 children suffering from minor ailment, but without any derangement of the intestinal tract, bacillus aērogenes capsulatus was isolated on the first examination in 9 cases. In the 9 other cases the organism was not obtained on the first trial, but subsequent examination revealed it in all instances. In 2 cases the first examination was taken, but material was not available for second trial.

In 7 breast-fed infants from the obstetrical ward the dejecta from 6 were taken for the "gas bacillus." It is evident, from the result of this inquiry, that bacillus aērogenes capsulatus must be regarded as a normal and constant inhabitant of the intestinal tract in children except in breast-fed infants. The attaching of any pathologic significance to the presence of this species in the intestines can, therefore, properly be made only when evidence can also be adduced to show its successive development.

R. D. M.

BABLER, EDMUND A.: CAVERNOUS AND CYSTIC LYMPHANGIOMA OF THE CECUM. (Journal of American Medical Association, February 27, 1915, p. 719.)

Babler presents another of the curious cases of lymphangioma so frequently found in children. The patient was a boy of fifteen with negative previous history and with symptoms of abscess of the appendix of four days' duration. At operation the appendix was normal, but there was a large tumor of the cecum and ascending colon, requiring resection of the lower ileum, cecum and part of the ascending colon. Recovery was uneventful. Examination of the growth proved it to be a lymphangioma of the mixed cavernous and cystic type, with partial organization of some of the coagulated contents. The origin of the growths is obscure, opinion being divided between independent new growth and simple dilatation of preëxisting lymphatics. The symptoms in this case were precisely those of acute inflammation of the appendix. The growth was 10 x 6 x 5 cm., partly enveloped the cecum and was covered for the greater part with peritoneum. The contents of the cysts were clear gelatinous or bloody material, the lining of smooth endothelium. C. E. F.

POOL, EUGENE H.: TRANSFUSION AND SPLENECTOMY FOR VON JAKSCH'S ANEMIA IN AN INFANT. (Annals of Surgery, March, 1915, p. 349.)

An infant, eight months old, born at seven months, presented the usual picture of von Jaksch's anemia, enlarged spleen, red cells between 1,400,000 and 2,400,000, white cells from 17,000 to 54,000, hemoglobin from 30 to 40 per cent. There was a marked lymphocytosis, many nucleated red cells, and a number of megaloblasts. As the child was growing progressively worse a transfusion by the Lindemann method was performed by Pool, ether was administered and the spleen removed. Recovery was uneventful and marked improvement followed, but was not fully maintained at the time of report. The red cells mounted rapidly to over 4,000,000 and the whites dropped to 13,000, while the hemoglobin rose to 85 per cent., but the differential count remained unchanged. C. E. F.

HOLT, L. EMMETT, AND BABBITT, ELLEN C.: INSTITUTIONAL MORTALITY OF THE NEWBORN. (Journal of the American Medical Association, January 23, 1915, pp. 287-290.)

In a collection of 10,000 births at the Sloane Maternity Hospital the authors report that 9,318 were born alive, 429 were stillbirths and 253 were abortions. They lay special emphasis on the value of their admirable statistics, as they are gathered from a hospital known for its accurate and intelligent work. Using as a base valuable recent statistics along the same lines and supplementing their own, they state that of 100 infant deaths during the first year of life, 33 occur in the first month, 28 in the first two weeks, 22 in the first week, and 13 on the first day. Of infants born alive, 2.5 per cent. die before they are a week old.

Their statistics are the same as Kerness' from the Universitäts Frauenklinik in Munich. Among the causes of premature births multiparæ were more common than primiparæ, and the age of the mother was without influence.

Causes of deaths during the first fourteen days are classified as due to—

Congenital weakness (49.4 per cent)	143
Accidents of labor	33
Malformations	12
Atelectasis	25
Asphyxia Neonatorum	8
Pneumonia	28
Congenital syphilis	13
Hemorrhage	10
Sepsis	9
Accidental	2
Undetermined	8

The authors comment on the unreliability of statistics of stillbirth due to the fact that there is lack of agreement on the part of keepers of records as to what constitutes a stillbirth. They regard the New York City records as being fairly trustworthy and compare the 1912 city record of 4.64 per cent. with the record for 10,000 Sloane births of 4.29 per cent. They agree that in general practice the stillbirth percentage should be about 4.

In summarizing their article the authors state the following: 48 per cent. of the total deaths and 66 per cent of those due to prematurity occurred on the first day. The mortality from conditions intimately connected with delivery made up 20 per cent. of the deaths of the first fourteen days. Syphilis caused 4 per cent. of deaths. Pneumonia was the only important disease developing after birth.

To quote the concluding paragraph: "When we come to consider to what degree preventive measures might influence the mortality of the first two weeks of life, two things stand out prominently—the great number of deaths from congenital weakness can be reduced only by care of the mother during her pregnancy; the number of stillbirths and the deaths from causes connected with parturition can be largely reduced by good obstetrics. S. McL.

BALFOUR, DONALD, C.: TONSILLECTOMY IN CHILDREN FROM THE STANDPOINT OF THE GENERAL SURGEON. (Annals of Surgery, March, 1915, p. 257.

Balfour says that the operation of tonsillectomy is not as simple as it seems and that attempts at removal by unskilled men result in incomplete removal or in damage to the tissues of the throat. The question of what tonsils should be removed is avoided by the author, who states that some tonsils are certainly better out than in. Two methods of operating are mentioned—dissection and the guillotine. Of these, he says the dissection method is the only sure one in all cases. Anesthesia is very important. Balfour believes in intermittent anesthesia apparently, as he advocates the reanesthetization after the first tonsil is removed. Deep anesthesia is not necessary. The Whitehead gag is used along with tongue retraction, skilled assistance, sponging, etc. The tonsil is seized with a uterine tenaculum, pulled into view and the anterior pillar dissected away and retracted. The tonsil is then pulled forward, dissected from the posterior pillar and removed with blunt dissection by scissors. Of the cases operated on under ether during the past six years, 1,654 in number, troublesome bleeding was encountered only once, and this was readily controlled by suture. C. E. F.

RAUL, SIGMUND C.: CONVULSIONS IN CHILDREN. (The New England Medical Gazette, January, 1915, p. 18.)

Recent physiologic studies, especially in the domain of metabolism, throw some light on the causes of general convulsions in infants where no anatomic changes in the brain are present. In addition to the convulsions the history and examination often reveal a heightened irritability of the motor nerves as evidenced by tetanic contractions, attacks of laryngismus stridulus, increased electrical excitability of the motor nerves, and the presence of Chvostek's and Trousseau's signs. Researches show that the mineral salts play a very important rôle in the disturbances of the nervous system. The salts of the monovalent elements, potassium and sodium, exert a stimulating and exciting effect upon the protoplasm of the nerve cell, while the divalent elements, calcium and magnesium, exert a sedative or inhibitory effect. One salt alone may be toxic, while a combination of salts may prove to be non-toxic. Thus, sodium chlorid alone will destroy certain forms of marine life, while the addition of potassium and calcium overcomes this toxic effect. This explains why Ringer's solution, which contains sodium, potassium and calcium, will keep a frog's heart beating longer than normal salt solution. If it were not for the presence of calcium in the blood our muscles would be in a constant state of contraction. The increased irritability of an infant's brain, when no pathologic lesion is present, may therefore be caused by some disturbance in the balance of the mineral salts. A deficiency of calcium in the brains of children subject to the type of convulsions discussed, has been demonstrated. The cause of the disturbed calcium metabolism may be a deficiency in the calcium of the food; breast milk may also be deficient in calcium. More frequently it is due to an increased excretion of calcium, chiefly through the intestinal tract, resulting from improper feeding. M. F.

WHALE, HAROLD L.: OTORRHEA. (The Practitioner, September, 1914, p. 368.)

The author classifies the otorrhea acording to the nature of the discharge. The fluid may be either: (1) cerebrospinal fluid, (2) serum, (3) blood, or (4) pus.

(1) The causes of cerebrospinal otorrhea are: (*a*) Pathologic—involvement of the petrous bone. (*b*) Traumatic—fracture of the basis cranii. (*c*) Operative. Diagnosis may be made by chemical and physical tests, but even apart from these, the *constant* flow of a *clear* fluid is pathognomonic.

(2) The causes of serous otorrhea are: (*a*) Acute bullous myringitis. (*b*) Subacute serous otitis media. (*c*) Herpes auricularis. (*d*) Eczema of the weeping type.

(3) The causes of a discharge of blood are: (*a*) Accidental trauma—fracture of basis cranii. (*b*) Operative trauma: (1) Removing impacted cerumen; (2) myringotomy, ossiculectomy; (3) curettage of the Eustachian tube. (*c*) Acute otitis media in diphtheritic cases. (*d*) Chronic otitis media with polypus. (*e*) Chronic otitis media without polypus, but with bleeding granulations. (*f*) Neoplasm of the external or middle ear.

(4) The causes of the discharge of pus are: (*a*) Furunculosis of the external ear. (*b*) Acute suppurative otitis media. (*c*) Chronic suppurative otitis media.

In general terms it may be said that a flow of cerebrospinal fluid or copious blood must be dammed; a flow of serum or pus, never. The treatment of a flow of cerebrospinal fluid or blood is that of the underlying cause. The same applies to the serous discharges. The causes of chronicity in otorrhea are as follows:

A. Insufficient drainage due to (1) omission of myringotomy after a small perforation in acute cases; (2) a collection of pus, or a cholesteatoma, in the attic; (3) a similar collection of pus, or granulations in the antrum; (4) More rarely, a small undrained focus of pus in Prussak's space; (5) metaplasia of the tympanic lining mucous membrane.

B. Chronicity of the infection, for instance, in tuberculosis.

C. Repeated reinfection by way of the Eustachian tube in cases of nasal obstruction or adenoids.

Operations for Otorrhea—

A. For acute cases. (1) Myringotomy; (2) Schwartze operation (if the mastoid antrum is involved).

B. For chronic cases. (1) Ossiculectomy; (2) the Stacke radical operation. Cases likely to require the radical operation: (1) Those of long duration; (2) adults; (3) cholesteatomata; (4) middle ear showing a large perforation; (5) granulations along the posterior wall of the tympanum; (6) intracranial complications of otorrhea. Cases less likely to require the radical operation: (1) Traumatic cases; (2) recent cases; (3) children; (4) cases in which adenoids or nasal obstruction coexist; (5) cases with massive granulations or polypi. H. R. M.

CROSS, FRANK B.: CEREALS IN MILK MODIFICATION. (Medical Record, March 6, 1915, p. 396.)

This is a resumé of the use of cereal diluents dating from 1876, when Jacobi first suggested that cereal decoctions be used in the modification of cow's milk for the very young. Other observers gradually took it up until, in 1912, Hess established beyond all doubt, by means of the duodenal tube, that the duodenal fluid contains an amylose or starch-converting enzyme. The question of the starch capacity of infants then came up. It was found to be so variable that with an excess of cereals poor digestion usually followed. As casein modifiers cereals are best known, their addition to cow's milk resulting in the formation of smaller, finer, softer and more flocculent casein curds. An additional energy to the food mixture is also supplied. Of all the cereals, and it is not used often enough, rice is the most easily digested, at the same time being equally nutritious. H. R. M.

BALLARD, I. WILLIS: THE X-RAY AS AN IDEAL LOCAL REMEDY FOR ECZEMA. (Medical Record, March 27, 1915, p. 523.)

The author points out the fact that the X-ray is a contractor of cell protoplasm. The pathology of eczema is always a circumscribed or diffuse hyperemia with dilatation of blood vessels, congestion and edema, together with cell infiltration and proliferation. Therefore the use of the X-ray is of importance in that it inhibits this congestion and dilatation, slows down the rapid cell metamorphosis, and soothes by long exposure to a soft tube or stimulates by short exposure to a hard tube. The author reports good results. The technique is not difficult. H. R. M.

SECORD, E. R.: BILATERAL CONGENITAL ABSENCE OF THE RADIUS. (Annals of Surgery, March, 1915, p. 381.)

The parents of this infant were apparently normal, but a careful examination of the mother showed thickening of the bones of the fingers. Three of the other 4 children were healthy, but 1 had a marked deformity of the arms and died in infancy. This one was covered with a typical papulo-squamous eruption of syphilis. Otherwise nothing was noted except the remarkable condition of the forearms. Both radii were absent, as proven by examination and by X-ray. The ulna on each side was present, the only deformity being the congenital absence of both radii. Secord considers the condition due to a congenital syphilis.

C. E. F.

STRUMSKY, MAX: NEGLECTED LATERAL CURVATURE. (Medical Record, March 13, 1915, p. 430.)

This is a plea for the early recognition of incipient scoliosis by medical means and not by leaving it to the mother, teacher or dressmaker for diagnosis. There are practically no disturbances during the early stage; the future sufferer may even enjoy perfect health. The child as a rule is utterly unconscious that he is the victim of this deformity. The regulation made by the Board of Education is that no child's spine is to be exposed. As the trouble generally starts in the sacrum and in the first lumbar vertebræ where the clothing is thickest, the chance for diagnosis is slim. Routine examination of the spine should be insisted upon. Early treatment in this condition is most efficacious. H. R. M.

MOFFETT, RUDOLPH D.: A NEW BABY BOTTLE. (Medical Record, March 13, 1915, p. 442.)

This new bottle has the following positive advantages: (1) The bottle has no neck, the body converging to its opening at the top. (2) Each bottle is accurately graduated and the lines of the ounces and half ounces are etched on the glass. (3) It requires only the usual size nipple. Owing to its shape the bottle can be readily cleansed and sterilized. H. R. M.

LEWIS, BRANSFORD: STUDIES IN OBSCURE FORMS OF PROSTATIC OBSTRUCTION AND VESICAL ATONY. (Annals of Surgery, March, 1915, p. 276.)

The only point of interest to the pediatrician in Lewis' article is his belief that many cases of obscure vesical atony and prostatic obstruction are due to congenital contractures at the neck of the bladder or to, occasionally, congenital syphilis. Symptoms of difficulty in micturition may be present from infancy, but the full development does not occur usually until adolescent years. He cites a number of personal cases and more from the literature and declares that they deserve more study and early recognition before incurable damage has been done. Dilatation of the stricture or contracture, possibly operative incision of the neck of the bladder, along with treatment of the syphilis, if such be present, is indicated. C. E. F.

ARMOUR, R. G.: DIAGNOSIS, SYMPTOMATOLOGY AND PATHOLOGY OF POLIOMYELITIS ANTERIOR ACUTA. (The Canadian Journal of Medicine and Surgery, February, 1915, p. 47.)

In reviewing the pathology of acute anterior poliomyelitis, the writer points out that it is a generalized infection, the lesions involving the intestinal tract, liver, spleen and kidneys. The virus affects chiefly the blood vessels and lymphatics surrounding the nervous tissue of the central nervous system. The blood vessels around the anterior horn cells are most numerous, thus acounting for the more extensive involvement of this region. When the blood vessels of the meninges of the brain are involved we have the meningeal form of poliomyelitis. Lesions may also occur in the pons and medulla, causing cranial nerve palsies and frequently causing death from involvement of the vital centers. M. F.

SCHNEIDERHÖHN, OTTO: THE TREATMENT OF HIRCHSPRUNG'S DISEASE. (Zeits. für Kinderhk., March 24, 1915, p. 321.)

Schneiderhöhn, of Salge's clinic in Strassburg, has written a very instructive monograph on Hirschsprung's disease with a bibliography of 260 names. One misses the name of Finney, and his very valuable work.

In 1888 Hirschsprung published his monograph on "Constipation in the Newborn Due to Dilatation and Hypertrophy of the Colon," since when this condition has received the name of Hirschsprung's disease. Years before other cases had been reported—27 in all.

The two cardinal symptoms of this disease are severe constipation and extensive dilatation of the abdomen. These two symptoms often appear at birth, or at other times not until weaning or toward the end of the first year of life. One can easily feel dilated masses of gut, especially if the abdominal walls are thin. Visible peristalsis is a very common sign. On percussion tympany is usually heard all over the abdomen. Often tumor masses of feces can be made out. Vomiting is a rare symptom.

There are many different opinions as to the etiology of this condition. Jacobi considers the hypertrophy and dilatation a secondary condition—due to a relative constipation. This constipation is caused by the abnormal length of the sigmoid flexure. Marfan agrees with Jacobi. The disease which has been described by Hirschsprung, and which bears his name, is due to a congenital dilatation of the colon.

Schneiderhöhn divides dilatation of the colon into three groups: (1) True congenital megacolon (Hirschsprung's disease); (2) hypertrophy and dilatation of colon due to abnormal length and motion of sigmoid flexure (Jacobi); (3) hypertrophy and dilatation of colon due to spasm of sphincter, etc.

Schneiderhöhn reports in full 4 of his own cases of Hirschsprung's disease, 2 of which were treated surgically and 2 medically. One of his surgically treated cases and one of his medically treated cases died, making a mortality of 50 per cent. The author has collected 358 cases from the literature. Of these, 110 were cured, 24 improved, 9 unimproved, and 176 died; 39 cases were lost sight of; 11 of the deaths were not due to the disease *per se*. The total mortality of all the collected cases was 43 per cent., with 30.7 per cent. cured.

Treatment—Opinions differ very much as to treatment. Hirschsprung advised daily enemata, and faradization. According to Schneiderhöhn one must decide in each individual case whether medical or surgical treatment should be employed. He advocates, as far as medical treatment is concerned, daily enemata, faradization and strychnin. If spasm is present opium and belladonna should be tried. Of the collected cases treated medically there was a mortality of 50 per cent. (151 deaths), and surgically only 36 per cent. (143 deaths). Resection of the colon in two sittings is the best surgical treatment. This operation does away with the entire megacolon, and seems the most rational method of treatment. Unless there is present an ileus or a peritonitis (which calls for immediate operation) medical treatment should first be given a trial. By medical treatment the patient's general condition is often improved, and at times the dilatation and hypertrophy is reduced. If spasm is present and if the spasm causes the condition, medical treatment alone will often cure. Medical treatment is much more favorable in children than in adults.

In conclusion, the author states that one must remember that each case is an individual, and one must decide whether the medical or surgical treatment is to be preferred. One should not operate unnecessarily, and, on the other hand, one should not wait too long with medical treatment. If all these conditions are considered the prognosis in the future will be much more favorable. J. S. L.

ROSENBLOOM, JACOB, AND MCKELVY, JAMES P.: A STUDY OF THE CHOLESTEROL METABOLISM IN A CASE OF CONGENITAL HEMOLYTIC JAUNDICE WITH SPLENOMEGALY. (Interstate Medical Journal, February, 1915, p. 138.)

One of the most characteristic findings in cases of congenital hemolytic jaundice with splenomegaly is the lessened resistance of the red cells to hypotonic sodium chlorid solution. This was first noted by Chauffard and has been confirmed by other investigators. The reason for this lessened resistance has never been explained. Rosenbloom and McKelvey present a study of the cholesterol metabolism in a patient with congenital hemolytic jaundice and have attempted to develop an hypothesis regarding the lessened resistance of the red cells. In testing the resistance of the red cells, the technique of Richards and Johnson was followed. For the metabolism study of the patient the diet contained, approximately, 60 grams of protein, 75 grams of fat, and 112 grams of carbohydrate, yielding about 1,395 heat units, or about 50 calories per kilogram body weight. It may seem from the table given that there was present in the patient some interference with the cholesterol metabolism, as shown by the large loss of cholesterol from the body. As Rosenbloom and McKelvy have found a disturbance of the cholesterol metabolism in this case, it was of value to consider certain phases of hemolysis. They believe that the jaundice in these cases is due to the fact that owing to some perversion of metabolism there is a lessened cholesterol content of the blood serum, and not enough cholesterol present to exert its antagonistic action to prevent hemolysis.

Following the splenectomy in this case of hemolytic jaundice there was an increase in the amount of re-cholesterol in the blood. This speaks in favor of the idea that there is some relation between the increased destruction of the red blood cells, as observed in hemolytic jaundice, and the cholesterol content of the blood. R. D. M.

BLAHD, E. N.: RESECTION OF THE POSTERIOR ROOTS FOR THE CURE OF LITTLE'S DISEASE. (The Lancet Clinic, March 13, 1915, p. 300.)

The author is thoroughly convinced that a distinct advance has been made in the treatment of Little's disease through resection of two or three of the posterior roots of a spinal segment controlling certain groups of spastic muscles. Only the severe cases of spasticity are selected for operation, as the mild cases can be treated by simple orthopedic measures. Details of the manner by which spasticity is pathologically produced and relieved by this operation are thoroughly explained. Novocain is injected locally into the spinal canal above the seat of operation, with the result that there is absolutely no shock. The patients must be educated to walk after the operation and tenotomies and plaster casts are necessary to correct deformities. In other words, the same amount of guidance and treatment must be employed as is usually given without operation.

Out of the author's 10 cases, 3 were absolutely relieved of spasticity and were eventually able to walk. In the remaining 7 cases, 5 give every prospect of being ultimately cured. One case, on account of marked atrophy, gives little promise of a good result. The sixth case was one in which ether anesthesia was used and died as a result of shock. It requires from one year to one year and a half before the full benefit of the operation is evident. The author closes by saying it is no longer necessary for the physician standing by the bedside of one of these poor patients to say, "Nothing can be done for you." E. F. W.

STEPHENSON, SYDNEY: HEMATOMA OF THE LOWER LID IN AN INFANT, AGED FIVE MONTHS: AN UNUSUAL MANIFESTATION OF INFANTILE SCURVY. (The British Journal of Children's Diseases, March, 1915, p. 77.)

During the first two months of life, the child was breast-fed and after that Nestlé's milk was given exclusively. The right eye was completely closed, and the swollen parts were chocolate-brown in color. The upper eyelid was not involved. The general condition was good; there were no swellings about the legs or arms; no tenderness on handling, and the gums were in excellent condition. A provisional diagnosis of scurvy was made and the child was placed on equal parts of "raw" milk and water. One teaspoonful of raw meat juice was given every three hours, alternately with a similar quantity of orange juice. Local applications were used on the eye. In one week the condition practically cleared up. H. R. M.

BENSON, REUEL, A.: OBSERVATIONS ON 1,500 ARTIFICIALLY-FED INFANTS. (Medical Century, February, 1915, p. 33.)

In work carried on for the past five years in the babies' dairies in New York City, Dr. Benson has had an opportunity to carefully study the artificial feeding of a large number of infants. In order to understand the extent and significance of the results which he obtained, it is important to be familiar with the workings of the three babies' dairies which he has under his charge. The milk formulas are prepared by a trained nurse, who is in daily attendance, and the milk is dispensed to each mother in a small portable ice-box, as many bottles as are needed for twenty-four hours. The babies are weighed once a week. No medication of any kind is dispensed. A visiting nurse goes to the home of each baby regularly and does what she can to improve the conditions as they apply to the baby. His results are remarkable, and the death rate has been 4 per cent., which is considerably less than the normal death rate for all infants in New York City, and decidedly less than the usually estimated 33 per cent. among artificially-fed infants. Benson did not find any appreciable number of mothers who were unwilling to nurse their babies. Studying a series of some 600 cases he found that 9 per cent. stopped nursing because it was necessary for the mother to work; 14 per cent. were discontinued because of the mother's illness, and about 77 per cent. found that they had insufficient supply of breast milk. He made an effort to continue the breast feeding where possible by increasing the amount of food that the mother obtained and by instructions in personal hygiene. Dr. Benson favors the use of medium top-milk mixtures as the most practical and for the majority of babies formulas were made from 7 per cent. top milk. However, he says that it is impracticable to stick to any one method exclusively. Babies whose digestive organs were seriously impaired, whose normal digestive capacity was reduced, and where their tolerance for food was much below normal, he believes that complete peptonization of a properly prepared formula is important. Cases of diarrhea were treated by the use of cereal gruel, especially barley gruel, either for twenty-four or forty-eight hours, followed by a weak milk formula. This, Dr. Benson believes, is perfectly satisfactory in cases that have been seen early, where there is not much evidence of marked prostration. In the severe cases he uses Finkelstein's casein milk with malt sugar. He also believes that dextrimaltose is to be preferred to milk sugar or any other sugar, as the infants gain more rapidly and digest more easily this form of sugar. In these 1,500 cases he has never used an antacid of any kind. R. D. M.

CLOPTON, MALVERN B.: APPENDICITIS IN CHILDREN. (Missouri State Medical Association, March, 1915, p. 94.)

Cases of appendicitis in children are marked by insidiousness of onset, rapidity of progress toward perforation or gangrene and extravasation of the intestinal contents. About 1 per cent. of the cases are in children from one to five years old. About 16 per cent. of all cases of appendicitis occur in children. Barmann estimates the mortality at 50 per cent. under five years. The author reviews in a very thorough manner the pathology, symptoms, diagnosis, complications, results and treatment. Special emphasis is placed upon the anatomic relation of the appendix to the surrounding parts. It is usually retrocecal or gangrenous. Urinary symptoms are very common on account of the close proximity to the bladder. Tenderness and muscle spasm can usually be demonstrated. The progress is so rapid that the cases must be seen at frequent intervals. Leukocyte count is merely confirmatory of inflammation, and the temperature, pulse and respiration are of secondary importance. The younger the child the deeper the appendix and the more pronounced the urinary symptoms. Rectal palpation is always in order, for the reason that abscess and peritonitis can be demonstrated by this means before there is any indication of the condition upon external examination through the parieties.

The author presents a very lucid differential diagnosis between appendicitis and the following: Pneumonia, intussusception, recurrent vomiting, hip joint disease, lumbar abscess from Pott's disease and tubercular peritonitis with enlarged mesenteric glands. Abscess, intestinal obstruction and septic pneumonia are frequent complications. The author contends that results are more favorable in children. Deaver reports a mortality of 4.6 per cent. in a series of 500 cases and in the author's series there was a mortality of less than 4 per cent. Early diagnosis is the most important element bearing upon mortality.

As to treatment, the author believes that all cases of appendicitis should be operated as soon as diagnosed. The most dangerous stage of the disease is between the third and sixth day before the disease is localized. In these cases the author always drains and removes the appendix if presented immediately to hand. The Kammerer incision is used, as it is easy to drain through, and if the wound can be closed gives an excellent result. Preference is given to nitrous oxid and oxygen anesthesia in pus cases and ether is generally used in the interval cases. E. F. W.

WEINSTEIN, JOSEPH: DEAFNESS FOLLOWING MUMPS. (Medical Record, February 27, 1915, p. 353.)

The author reports the following case: J. J., male, eight years of age. Perfectly well two weeks ago. Hearing perfect. Attended school, making good progress. Developed mumps two weeks ago, and left parotid appeared more swollen than the right. Heard normally for two days during the progress of the mumps, and for two days thereafter, when he became partially deaf and said that he heard sounds as if they were very far away. At the end of five days deafness was complete. The otoscopic picture showed that both drums were normal. Functional tests elicited complete deafness. Diagnosis: Labyrinthine deafness following mumps. The prognosis is bad, the condition being rarely affected by treatment. H. R. M.

SHEPPARD, J. E.: THE CLINICAL SIGNIFICANCE OF BACTEREMIA. (Annals of Otology, Rhinology and Laryngology, December, 1914, p. 864.)

This article is a report of 4 cases, 3 of which are children who developed aural infections. The first case, a girl of seven, had measles in June, 1913, and a resulting purulent otitis in the right ear for which a mastoid operation was performed on July 17th. The findings at this time were simple infection of the mastoid cells. On August 12th there occurred chills, vomiting and a rise of temperature to 104°. A blood culture showed streptococcus longus and the lateral sinus was opened. Though no thrombus was found, it was thought the infection originated here, for when the blood culture was reported negative on September 13th the temperature fell to normal and the recovery was rapid.

Case 2, that of a boy of seven, whose illness began with headache and pain in the left ear on April 11, 1914. His temperature was 106°. On the eighth day there was another rise, with twitching of the eyes and rigidity of the neck, the left drum was congested and the cervical glands on that side enlarged. Under treatment the temperature subsided, but was again high on the 24th. There was a leukocytosis of 32,600 and 80 per cent. polynuclear cells. A blood culture was sterile at this time, April 28th. Having excluded all other probable causes of high temperature, the left mastoid was operated upon and a large broken-down thrombus found in the lateral sinus. Culture from this showed streptococcus longus. The recovery after the operation was uneventful.

Case 3, boy of four, whose illness began with an attack of grippe on April 27, 1914. He had a resulting otitis on the right side and a drum incision followed by hot irrigations.

There was a low fever for four days and then developed a chill, high temperature and headache. His blood showed 20,000 leukocytes, with 91 per cent. polynuclear cells, and a blood culture gave a growth of streptococcus brevis. The blood count by

May 9th fell to 8,600 leukocytes and 66 per cent. polynuclear cells and recovery followed without an operation.

The deductions drawn from these cases are that not all cases of otitic bacteremia need operation, but our best judgment is required and the following aids will help: (1) The general condition of the patient; is there sepsis? (2) The temperature curve. (2) Is the process local or general? (4) Blood counts to show resistance. (5) Blood cultures frequently taken to show increase or diminution of number of colonies. S. W. T.

BOOK REVIEW

TUBERCULOSIS OF THE BONES AND JOINTS IN CHILDREN. By JOHN FRASER, M.D., F.R.C.S.E., Ch.M., Assistant Surgeon Royal Hospital for Sick Children, Edinburgh. $4.50. New York: The Macmillan Company, 66 Fifth Avenue.

This book is the outcome of an investigation carried on on a large number of cases of tuberculous diseases of the bones and joints at the Children's Hospital and at the Chalmers Hospital, Edinburgh. The pathological and etiological aspects of the studies were first presented as a thesis for the degree of M.D. of Edinburgh University in 1912. The book is divided into two portions, a consideration of the disease from the general aspect, and an investigation of individual regions of tuberculous disease. At the end of each section there is a complete review of the recent literature treating with this subject, and the author wishes it clearly understood that he has not personally investigated or consulted all of the references given, therefore he cannot vouch for their accuracy. However, he believes they are a help for reference work. The book is profusely illustrated in black and white and colored plates of the microscopical pathology of tuberculosis, and the reviewer believes that it is the most complete publication upon this subject and well worth a careful reading by those who are interested in this subject. Further on in the volume the various methods of treating tuberculosis of the bones and joints are fully described and amply illustrated, giving numerous case reports which are of great benefit to the practitioner.

ARCHIVES OF PEDIATRICS

AUGUST, 1915

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ORIGINAL COMMUNICATIONS

THE ETIOLOGICAL RELATIONSHIP OF SYPHILIS TO CHOREA OF SYDENHAM *†

BY HENRY KOPLIK, M.D.
New York, N. Y.

The etiology of chorea is still a subject of speculation and investigation. It is true that in some cases microörganisms have been found in the blood. I need not mention that Sachs found a streptococcus in one case which he has called infectious chorea. Poynton also has found a diplococcus, but with the ex-

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ception of these, the investigations into the etiology of Sydenham's chorea have been devoid of any definite results.

There is clinically an undoubted connection between chorea and endocarditis, between chorea and rheumatic joint manifestations, because in an overwhelming number of cases of chorea, there is not only a history of joint pains, but in cases of recurrent attacks there is a gradual but certain involvement of the endocardium. In many cases of purely rheumatic endocarditis there are periods in which, during the recrudescence of endocarditis, choreic manifestations make their appearance for a variable period of time. Moreover, in some cases of chorea, as the disease, even in the first attack, increases in severity, the endocardium becomes more and more seriously involved, with the appearance of murmurs, and even pericardial involvement, absolutely the counterpart of what is observed in purely rheumatic cases. Such a case is the following, of a child who, in her first attack of chorea, was carefully observed, and from mild symptoms, the chorea became more and more severe, to such an extent as to finally cause complete paralysis, loss of speech, and constant restlessness:—

Female, eight years of age. Admitted March 17, 1915.

Diagnosis—Chorea minor paralytica, periendocarditis.

Family History—Parents and 4 other children well.

Past History—Measles. Attacks of tonsillitis since age of two years. No previous similar attack.

Present Condition—Had attack of tonsillitis two weeks ago. Two weeks later became fidgety, and five weeks ago exhibited choreiform movements of all limbs and body, child being unable to stand or walk. Speech has become indistinct. Has been in bed five weeks. One week ago began to have attacks of sticking pain in left chest from shoulder to abdomen. Moderate degree of continuous fever. Four days ago began to have slight cough and small sores appeared on lips. History of recurrent attacks of tonsillitis.

Synopsis—Tonsillitis, choreiform movements, five weeks; pain in left chest, fever, herpes, one week.

PHYSICAL EXAMINATION—*General Condition*—Acutely ill. Absolutely paralytic, and in constant choreiform motion. Speech impossible. Mind very much disturbed. Irritable.

Head—Eyes: Negative. Ears: Negative.

Mouth—Lips: Ulceration at right angle; sordes. Teeth: Sordes. Tongue: Strawberry type; sordes. Pharynx: Congested; tonsils slightly enlarged.

Neck—Negative.

Chest—Respiration rapid.

Lungs—Right: Anteriorly negative and posteriorly negative. Left: Anteriorly, dull in lower axilla, with absent breath sounds. Posteriorly, dull to flat from spine of scapula to base. Bronchial respiration, and voice with increased fremitus over this area, except at base, where breath sounds are absent.

Heart—Upper border, second rib; right border, sternum; left border, 4 inches to left of mid line in third space; apex, felt in fifth space 3 inches to left of mid line. Continuous thrill felt over base of heart. At apex is heard a to and fro friction. Also systolic blow. At base is heard a pericardial friction with greatest intensity at pulmonic area. Pulmonic second sound accentuated. Left border of heart merges with dullness in lower left axilla. Action is rapid, regular and of fair quality. Pulses likewise.

Abdomen—Retracted, soft, tympanitic.

Liver—Indistinctly palpable, ½ inch below free costal border; tender.

Spleen—Not felt.

Kidneys—Not felt.

Extremities—Negative.

Genitalia—Negative.

Spine—Negative.

Skin—Negative.

Glands—Numerous small axillary nodes.

Synopsis—Generalized chorea, herpes, lung signs, cardiac signs, enlarged liver, glands—palpable.

March 18th: White blood corpuscles, 21,000; polymorphonuclears, 78 per cent.; lymphocytes, 22 per cent.; blood pressure, 120-70.

March 19th: Much improved. Pericardial friction not as marked as yesterday.

March 22d: Dull at left base, with absent fremitus. Distant breath sounds, egophony—fluid in chest increasing. Temperature, normal.

March 31st: Patient's general condition has rapidly improved. Lung signs have cleared, chorea likewise. Cardiac signs as to endocardial murmur unchanged.

Temperature—102° on admission. In twenty-four hours was about 100°, and fluctuated between 100° and normal thereafter.

Pulse—120-140 on admission. Later, 90-100.

In this case as the chorea increased in severity, the heart became more and more involved, until a permanent lesion of the valves resulted. This child made a complete recovery from her paralytic chorea, but with a heart badly damaged as to its endocardium. Such a case, no doubt, is a convincing proof to one set of clinical observers that chorea is an acute or subacute infectious disease. The nature of this infection and its mode of entry into the body is, as I have pointed out, still a matter of speculation. The term "rheumatic" is an unfortunate one, in that there has recently been a tendency to separate forms of endocarditis into those which are purely rheumatic and those which are infective, as if rheumatism was an entity which might exist without infectious organisms playing any etiological rôle in its occurrence, and also that endocarditis, complicating acute inflammatory rheumatism, might also be a disease in which infectious microörganisms might not play any rôle. This is, I think, wrong teaching, inasmuch as it is unfortunate to speak of chorea as rheumatic or not rheumatic.

The minute subdivision of disease etiologically is not a mark of clear clinical grasp of a subject. And so it may eventually be proven, not only that all endocarditis is infectious, whether or not accompanied by inflammatory manifestations in the joints, or mere joint pains, or in the absence of either. The same may be true of chorea. All chorea of the Sydenham type seems to me to be of an infectious nature. What it is we do not definitely know, but the whole clinical course of the disease speaks for this. The gradual or sudden onset, the advance toward severe manifestations, the gradual involvement of the heart, even in the absence of any temperature, and its final subsidence, speak in favor of the infectious theory. Finally, the recrudescence of symptoms after a lapse of months, and their subsidence with eventual involvement of an endocardium which at first was free from involvement, all speak for, rather than against, the presence in the circulating blood of some infecting agent, whether it be so minute or delicate as not to be possible of cultivation, or whether our present culture methods do not reach it. Among others I have diligently had the blood cultured in many cases of chorea, but have failed to isolate any microörganisms.

Of late there has been an effort to connect chorea in an etiological way with syphilis. This can be explained by the great impetus given to the study of the treatment of syphilis not only by the investigations which have revealed its etiology, but more especially by the attempt to cure syphilis in one stroke by means of a sovereign remedy. On the appearance of salvarsan, this remedy naturally was tried in a great variety of diseases whose etiology was obscure, and among them chorea. With the use of salvarsan in chorea, many saw a rapid advance in its therapy. The reason for the use of salvarsan in chorea is easy to find. Arsenic has for decades been a favorite remedy in chorea. In the form of Fowler's Solution its use has been widespread with varying results. What, with pushing the drug to the point of toleration by the mouth, could be more natural than to apply the same drug in another form by injection into the circulation. Among the first to apply this remedy, salvarsan, in the treatment of chorea, was Bokai, who thought it of great benefit in the treatment of the disease, especially in cutting short the duration of the affection. From this, to a surmise by others, that there might be a connection between chorea and syphilis, was but a step easily taken.

One of the first communications on this subject is that of Flatau Germanns (uber chorea luetica) on so-called syphilitic chorea. In this case the chorea, as chorea, clinically, does not appear one of the pure Sydenham chorea. There were convulsions, meningeal symptoms, and the chorea was of five years' standing. Wassermann positive, ordinary chorea treatment ineffective, but a success on the injection of salvarsan with subsequent application of mercurial inunctions. There was in this case a history of hereditary syphilis. Sallinger records a case of chorea minor in a girl hereditarily luetic, ten years of age, given salvarsan, with recovery in three weeks. More pretentious are the French communications on this subject. Especially notable are those of

Milian on the syphilitic nature of Sydenham's chorea. He reports 15 cases of chorea with positive syphilis in 11 (73 per cent.). These cases had marked stigmata, such as cranial anomalies or retarded development. Only 1, however, had a positive Wassermann reaction, 7 had cardiopathies, and 4 hereditary syphilis. Other cases by Apert and Rizard are mentioned. He concludes that syphilis is an important etiological factor in chorea, as suggested by its symptoms (?), which at least do not exclude the possibility of its syphilitic origin. In another communication Milian reports 2 cases of chorea with a positive Wassermann reaction, which made a rapid recovery upon mixed mercurial treatment. He further emphasizes the conclusion that chorea of Sydenham may have an acquired or hereditary etiology. Babonneix, in an appreciation of the work of Milian, contends that chorea is frequently luetic in origin, and gives a resumé of cases reported by Ingelrans in 1904, but rather leans to the presumption that chorea is rheumatic, and that the favorable action of arsenic in chorea is no proof of its luetic nature. Of 145 cases of chorea only 36 suggested hereditary syphilis.

Weill, Mouriquand and Goyet comment on the improvement of grave chorea by the injection of salvarsan into the rectum. In another note, Weill, Morel and Mouriquand report cases of chorea treated by rectal injection of salvarsan. Tribaulet finds that of 350 cases of chorea only 3 were suspected to have had hereditary syphilis. Szametz simply records a case of chorea treated by salvarsan, a rheumatic boy whose rheumatism was followed by chorea. Pawlow reports a similar case. In the bibliography attached to this paper will be found further references to the literature upon the connection of syphilis to chorea, which are enough to show the widespread interest awakened by this subject within recent years.

In order to enlighten myself as to the relationship of syphilis to chorea, and for the benefit of the children, I took 11 successive cases of chorea, in my hospital service, of ages ranging from six years to thirteen years. In 5 of these cases there was an endocarditis on admission to the hospital, with an evident lesion of the valves, in 3 cases a distinct history of rheumatism or rheumatic pains, in 10 cases a Wassermann reaction was made, and in 8 the result was satisfactorily negative. In 2, the reaction, for one reason or another, failed, but was not positive. In all the cases there were absolutely no stigmata of syphilis, hereditary or otherwise, nor could syphilis be traced, in any way, in the family history. There is no reason why, had I subjected a large number of cases to the Wassermann test, I should not eventually meet cases in which it might be established that syphilis was present, either in the form of some lesion, or with the Wassermann reaction. For a child affected with syphilis might contract chorea just as readily as another, yet that would hardly prove the rule, to my mind. The presence of syphilis might be accidental, and not a causal element in the case. Nor are children affected with hereditary syphilis more prone than others to contract chorea, at least this is the impression one obtains from a study of the question. The attempt of some French writers to accept a luetic basis for chorea, on the ground that the salvarsan treatment is of especial effect in chorea, is, also, to my mind, not convincing. I desired for the benefit of the service, and also of these unhappy children, to test not only this question in all its bearings, but also the very important question of the therapeutic action of salvarsan in chorea minor.

For this part of the work, I enlisted the services of an expert in intravenous injections of neosalvarsan. Nine cases were thus injected with neosalvarsan in doses ranging from 0.15 gram to 0.4 gram of the drug. Of 7 cases thus injected, once or repeatedly, the effect, which in some quarters is described as striking, in that the symptoms immediately subside, was not observed. Even after second and third injections the chorea continued to run its accustomed course. The average duration of the disease, after the last injection of the drug, was thirty-six days, in 7 cases. Certainly not encouraging. In another case a nephritis resulted and the patient was ill with chorea for some weeks after, though finally a recovery took place. Again the administration of the salvarsan requires a certain amount of apparatus, and is not exactly applicable as a therapeutic measure in chorea. Nor can the drug be said to cause such striking improvement as to encourage a continuance of its use, nor does it prevent relapse. (See Case 3.) In fact, there is nothing in these results to warrant any assumption of a possible syphilitic or parasyphilitic influence as a causative factor in chorea of Sydenham. I do not think we have in salvarsan an agent of any value above what has hitherto been in vogue in the treatment of chorea minor, nor do I feel that we are warranted in tracing any relationship between chorea of Sydenham and hereditary or acquired syphilis.

CASES

CASE 1. Female; age, twelve years; occupation, schoolgirl. Admitted November 12, 1913. Discharged December 30, 1913.

Diagnosis—Chorea minor.

Past History—Measles, tonsillitis. Has had several attacks similar to present one for which she was in this hospital.

Present History—For past seven months patient has had peculiar twitching movements of head, arms and legs. Speech has become affected, but can walk.

Examination—Patient not acutely ill. Has choreiform movements of head, arms, legs and trunk. Speech indistinct. Heart: At apex is heard soft, blowing systolic murmur transmitted out to axilla; pulmonic second sound accentuated.

November 14th: As patient walks she has a choreic strut, moves upper extremities, muscles of head and face. As she lies in bed she is in constant motion. Movements of tongue, face and extremities are evident. Neosalvarsan, 0.3 gram given.

December 3d: Neosalvarsan, 0.3 gram given.

Temperature—Ranged between 98° and 99.6°, occasionally 97.8° or 100° and 100.2°.

Urine—November 13th: Amber; clear; acid; 1,030; trace acetone and trace indican; occasional white blood cells. After November 13th: Urine amber; acid; 1,022-1,040. On December 24th, calcium oxalate crystals present.

Laboratory Examination—November 14th: Wassermann; serum too anticomplementary for testing.—Dr. Kaliski.

CASE 2. Female; age, twelve years. Admitted December 7, 1913. Discharged December 22, 1913.

Diagnosis—Chorea minor.

Past History—Measles, whooping-cough, scarlet fever, frequent attacks of tonsillitis for which tonsillectomy was done. Has had attacks of rheumatic pains.

Present Illness—For past few weeks child has been nervous, makes twitching movements of hands and legs. Has had no fever. Also complains of rheumatic pains in all joints and occasionally in heart.

Examination—Patient fairly well nourished; at times choreic movements of hands and legs. Examination otherwise negative.

December 8th: Systolic murmur over the apex half way between sternum and apex, mild in character.

December 17th: Neosalvarsan, 0.15 gram given.

December 22d: Neosalvarsan, 0.3 gram given.

Temperature—Ranged between 99° and 100°, occasionally 98° or 98.6°, once, 97.8°.

Urine—Amber; acid; 1,024-1,044; on one occasion (December 17th) very faint trace albumin; many epithelial cells, calcium oxalate crystals.

Laboratory Examination—December 8th: Wassermann test, negative.—Dr. Kaliski.

CASE 3. Chorea. Salvarsan injection. Relapse. Male; age, twelve years; occupation, schoolboy. Admitted February 17, 1914. Discharged February 17, 1914.

Diagnosis—Chorea minor.

Past History—Scarlet fever at six years of age, complicated by measles, pneumonia and chicken-pox. Suffered with severe epistaxis at that time, for which he was treated by laryngologist, who removed adenoids and tonsils. In general, patient bleeds very much after injuries. After scarlet fever patient had chorea for three weeks. Was treated in this hospital. On June 2, 1913, neosalvarsan, 0.2 gram, was given, with marked improvement (?) of symptoms on June 10th. Discharged from hospital on June 12, 1913.

Present Illness—Onset two weeks ago with twitchings involving arms, legs, face and tongue. Has difficulty with speech. Cannot play with other children. Complains of "tired feeling." Can control twitchings better in school than at home. Movements do not cease at night and sleep is consequently disturbed.

Examination—General condition good. Choreiform movements moderate severity, involving entire body, including tongue and face. Heart: Negative except for reduplicated first sound at apex.

Temperature—Ranged between 98.4° and 100°.

Bedside Notes—Hot colon irrigations. Warm packs.

CASE 4. Female; age, six years. Admitted September 11, 1913. Discharged November 23, 1913.

Diagnosis—Chorea minor.

Previous History—Had measles and scarlet fever two years ago.

Present Illness—For past week mother has noticed that child moves its limbs and body involuntarily. No symptoms pointing to cardiac or renal disturbance.

Examination—General condition fair; marked incoördinate twitching of muscles of entire body. Skin: Scaly, erythematous rash on face. Examination otherwise practically negative.

September 17th: Patient received 0.15 gram neosalvarsan intravenously.

September 22d: Patient received 0.3 gram neosalvarsan intravenously.

September 25th: Patient received 0.3 gram neosalvarsan intravenously.

September 29th: Vaginal smear negative for gonococci.

September 30th: Choreic twitchings are still very marked. Urine shows evidence of slight nephritis.

October 2d: On account of some red blood cells in the urine, injections of neosalvarsan are discontinued.

October 6th: Rests at night; chorea less; appetite good; fingers more involved than rest of arm.

October 16th: Though the patient has less choreic movements, she is unable to walk.

October 22d: Improving daily; sitting up, walking; choreic movements scarcely noticeable.

Temperature—September 11th, 98.4°-101°; September 12th-17th, 98.4°-100.2°; September 18th-24th, 98°-100.2°; September 25th-October 1st, 98.6°-99.8°; October 2d-3d, 97.6°-98°; October 4th-8th, 98°-99.4°; October 9th-22d, 98.6°-100°; October 23d-29th, 98.8°-100.6°; October 30th-November 5th, 98°-100°; November 6th-19th, 98.4°-99.8°; November 20th-23d, 98°-100.2°.

Urine—September 12th-24th: Clear; acid; white blood cells; hyalin and granular casts. October 1st: Clear; acid; few red blood cells; white blood cells and epithelial cells.

CASE 5. Male; age, seven years. Admitted September 12, 1913. Discharged November 27, 1913.

Diagnosis—Chorea paralytica Sydenham. Large necrosis of skin and furuncles.

Previous History—Had measles three years ago. Similar attack to present one two years ago.

Present Illness—For past two weeks patient has had involuntary twitching of muscles of limbs and trunk. No cardiac or urinary disturbances.

Examination—General condition fair; marked incoördinate twitchings of muscles of face and extremities. Skin: Abrasions over right knee. Lungs: Negative. Heart: Slight impurity of first sound at apex. Extremities: Knee-jerks exaggerated.

September 30th: Has developed two furuncles over right shoulder region. Lower and larger of two has necrotic center; dressed with wet dressing.

October 3d: Acne and furunculosis; large area of necrosis size of quarter at angle of scapula; acne eruption general; furuncle on calf of right leg, forearm of right extremity of angry, green color. He lies absolutely helpless in constant motion, hands sometimes clenched. No knee-jerks obtainable. Is irritable and then laughs. Unable to lift the left hand to any extent; can lift both extremities, upper and lower, very incoördinately; right upper stronger than left. Musculature of right upper extremity appears stronger than left. Patient is restless at night.

October 4th: Abscess present on right forearm. Incision ½ inch long made over this and pus expressed.

October 5th: Incision insufficient for drainage of abscess of right forearm. Sinus about 2 inches in length present.

October 9th: Since patient has been put on chloral he is considerably more quiet, is in good humor, is completely paralytic. Furuncles and abscesses present.

October 10th: Today there is a fair-sized abscess in calf of right leg; this was incised and pus liberated. Abscess in arm shows slight discharge. Lesions on back are healing rapidly. Furuncles on tragus of right ear.

October 18th: All wounds healed. Because of tendency toward drop foot, starch bandage was put on right foot.

November 26th: Perfect physical condition; no sign of chorea.

Temperature—September 12th, 97°-99°; September 13th-18th, 98.2°-99.8°; September 19th-25th, 98°-99.2°; September 26th-October 2d, 98°-101.2°; October 3d-9th, 98.8°-102.6°; October 9th-November 27th, temperature ran between 98° and 99.2°, with occasional drops to 97°.

Treatment—Warm packs.

October 9th: Injection of staphylococcus vaccine, 20,000,000.
October 12th: Injection of vaccine, 20,000,000.
October 16th: Injection of vaccine, 20,000,000.
October 20th: Injection of vaccine, 40,000,000.

Urine—Usually clear; amber; acid; microscopically negative.

Laboratory Examination—October 2d: Wassermann test, negative.—Dr. Kaliski. October 4th: Pus from furuncle, staphylococcus pyogenes aureus (vaccine in preparation).—Dr. Celler.

CASE 6. Female; age, six years. Admitted September 12, 1913. Discharged November 28, 1913.

Diagnosis—Chorea minor.

Past History—Had measles at age of two; no rheumatism or scarlet fever.

Present Illness—For past four months child has been exhibiting involuntary movements of muscles of face, trunk and extremities. No cardiac or urinary disturbances.

Examination—Incoördinate twitchings of hands, arms, legs and mouth. Skin: Scattered patches of clotted blood over extremities. Furuncle on right thigh. Heart and Lungs: Negative.

September 30th: Choreiform twitchings less marked than on admission. Vaginal smear negative for gonococci.

October 3d: Child has an eruption on surface of body which may be a bromide acne. The muscles of face, arms and lower extremities affected. Choreic movements, reflexes of knee present, but sluggish. Chorea of tongue and face. Holds head perfectly and when sitting up is in constant motion. Will not stand or walk and has outbursts of crying while attempting to walk.

October 6th: Neosalvarsan, 0.225 gram, intravenously.

October 7th: Condition not improved.

October 15th: Neosalvarsan, 0.2 gram, given intravenously.

October 22d: Markedly choreic, subject to fits of temper. Cannot walk, or stand. Facial movemeints. Neosalvarsan, 0.215 gram, given intravenously.

November 26th: Still has habit movements; mental status not normal.

Temperature—September 12th-October 6th, 98°-99.6°; October 7th, 97.8°-100°; October 8th-15th, 97.8°-100°; October 16th, 98.4°-101.2°; October 17th-21st, 98°-100°; October 22d, 99°-102.4°; October 23d-30th, 98.6°-99.8°; October 31st-November 14th, 97°-99°; November 15th-28th, 98°-99.2°.

Treatment—Warm packs. Ears irrigated. September 12th: Mixed bromides given. September 16th: Bromides stopped.

Urine—Clear; acid; 1,022-1,034; occasionally calcium oxalate crystals present; on October 1st and 15th occasional white blood cells.

Laboratory Examination—October 2d: Wassermann test, negative.—Dr. Kaliski.

CASE 7. Male; age, eight years. Admitted September 25, 1913. Discharged November 23, 1913.

Diagnosis—Chorea minor.

Previous History—Had measles.

Present Illness—Onset three weeks ago with fever and headache. Has vomited three or four times since onset, vomiting not projectile. Bowels normal. Appetite poor.

Examination—General condition good. Choreiform twitchings of hands and arms, feet and legs. Mouth: Teeth and gums poor. Tongue coated. Examination otherwise negative.

October 10th: Though patient lies in bed quietly and with mild chorea in bed, is unable to walk.

October 15th: Received 0.2 grams neosalvarsan.

October 17th: Choreic movements slight, but present, especially of tongue and face.

October 18th: Patient this morning is more disturbed and nervous than he has ever been, and it is barely possible that the treatment and excitement has been the direct cause. Neosalvarsan treatment stopped.

October 22: Upper and lower extremities and face and tongue in constant motion.

Temperature—Temperature ranged between 98° and 99.8°, occasionally 97° or 97.6°, and on three occasions reached 100°.

Bedside Notes—Warm packs, cold rubs, aspirin and bromides used.

Urine—October 17th: Turbid; acid; calcium oxalate crystals; amorphous urates. October 22d: Calcium oxalate crystals.

Laboratory Examination—October 9th: Wassermann test, negative.—Dr. Kaliski.

CASE 8. Male; age, eight years. Admitted October 12, 1913. Discharged October 25, 1913.

Diagnosis—Chorea minor. Scarlet fever.

Family History—Mother and father well; two other children are well; history otherwise negative.

Past History—Measles at four years. Whooping-cough at five years.

Present Illness—Onset began about three months ago, when his violin teacher noticed that the boy could not use his bow properly in playing the instrument. Since then he also had muscular twitchings of shoulders, trunk, head and lower extremities. The boy has improved somewhat under a physician's treatment.

Examination—General condition: Boy well nourished; very slight choreic movements. Eyes: No palsies or nystagmus. Mouth: Tongue moves irregularly on protrusion. Tonsils: Moderately enlarged. Lungs: Negative. Heart: Pulmonic second sound slightly accentuated, otherwise heart is negative. Liver: Negative. Spleen: Negative. Extremities: Knee-jerks obtainable.

October 15th: Patient received 0.2 gram neosalvarsan intravenously.

October 17th: Patient has not improved; can stand alone, but walks with an incoördinate gait. Slightly choreic in all extremities and muscles of the face.

October 22d: Patient received 0.215 gram neosalvarsan intravenously.

October 24th: Patient to-day developed an indefinite punctate rash over body, which is very prominent posteriorly (rubeola).

October 25th: Transferred to Willard Parker Hospital.

Temperature—October 12th, 100.4°; October 13th-21st, 98°-99.8°; October 22d, 98.6°-100°; October 23d, 98.8°-103.8°; October 24th, 102.6°-104°; October 25th, 100.4°-103.2°.

Urine—Negative.

CASE 9. Female; age, seven years. Admitted October 16, 1914. Discharged November 27, 1914.

Diagnosis—Chorea minor.

Past History—Measles, chicken-pox. Following measles one and one-half years ago, child developed chorea. Was in this hospital five months ago for this ailment. Since onset one and one-half years ago child has had several attacks of tonsillitis and one attack of rheumatism.

Present Illness—Child has had a recurrence of choreiform movements. No sore throat, fever or rheumatic pains. Walks unsteadily and speaks indistinctly.

Examination—Generalized choreic movements present. Heart: At apex soft blowing systolic murmur transmitted to left; pulmonic second sound accentuated. Extremities: Knee-jerks and Achilles reflexes present.

October 18th: Stool: No ova present.

October 22d: Child has mild choreic movements of face and extremities; somewhat incoördinate in walking. Case of mild severity. Systolic murmur at apex. Neosalvarsan, 0.215 gram, given.

October 24th: Patient's movements the same as before injection.

October 29th: Neosalvarsan, 0.215 gram, given intravenously.

November 7th: Patient has not improved since last injection.

Temperature—Ranged between 98° and 99.8°, with occasional rises to 100°, once 100.6°.

Treatment—Cold packs.

October 22d: Vomited.

Urine—October 22d: Clear; acid; 1,038; trace indican; calcium oxalates. October 29th: Clear; triple phosphates. November 19th: Acid; 1,030; ammonium urates.

Laboratory Examination—October 19th: Wassermann test, negative.—Dr. Kaliski.

Case 10. Female; age, thirteen years. Admitted October 16, 1913. Discharged November 27, 1913.

Diagnosis—Chorea minor.

Past History—Measles, scarlet fever, tonsillitis four years ago, after which her tonsils were removed. At same time child had attack similar to present. No history of rheumatism.

Present Illness—Present attack began three months ago with violent movements of arms, legs, head and trunk. Child is unable to walk steadily and talks indistinctly. No fever, no rheumatic pains.

Examination — Marked generalized choreic movements; speaks with difficulty. Heart: At apex soft blowing systolic murmur transmitted to base; pulmonic second sound accentuated. Extremities: Knee-jerks and Achilles present.

October 18th: Polynuclears, 59 per cent.; small lymphocytes, 29.5 per cent.; large lymphocytes, 5.0 per cent.; eosinophiles, 6.0 per cent.; basophiles, .5 per cent. Stool: Moderate number of ova of trichocephalus dispar present.

October 22d: Patient is very incoördinate; muscles of face and extremities are in constant motion. Walk is incoördinate and presents a picture of a case of moderate severity. Systolic murmur present at apex. Neosalvarsan, 0.215 gram, given.

October 29th: Still very choreic as to tongue, face, extremities, cannot walk.

October 29th: Neosalvarsan, 0.4 gram, given.

November 17th: Slight improvement. Melancholic expression; incoördination of movements still present.

Temperature—Usually ranged between 97.8° and 99.8°, with occasional rises to 100° or 100.2°.

Urine—October 22d: Acid; indican present; 1,026; calcium oxalates; after October 22d, urine negative.

Laboratory Examination—October 19th: Wassermann test, negative.—Dr. Kaliski.

Case 11. Female; age, six years. Admitted January 19, 1914. Discharged March 12, 1914.

Diagnosis—Chorea minor.

Past History—Measles at second year. Rheumatism at third year involved hands and feet, swollen, hot, much fever. Duration six weeks.

Present Illness—For last eight days father has noticed twitching of mouth, hands and feet and difficulty with speech.

Examination—General condition fair. General choreiform movements of face, arms, legs and trunk. Speech: Difficulty in starting. Nodes: Generally enlarged. Heart: Action somewhat irregular (nervous type). Soft systolic at apex. Pulmonic second sound much accentuated.

January 20th: von Pirquet, negative.

January 22d: Twitchings when at rest and in bed and face flushed.

January 26th: Neosalvarsan, 0.15 gram, given.

January 27th: Patient seems more nervous than usual.

January 30th: Patient not improving under neosalvarsan. Treatment with aspirin and bromides ordered.

Temperature—Ranged between 98.4° and 100°, once 101°.

Treatment—Warm packs and cold packs. Mixed bromides and aspirin.

Urine—Amber; acid; occasional hyalin casts and calcium oxalate crystals.

Laboratory Examination—January 27th: Wassermann test, negative.—Dr. Kaliski.

30 East Sixty-second Street.

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PREVENTION OF VULVOVAGINITIS IN CHILDREN—F. J. Taussig (American Journal of Medical Science, 1914, Vol. CXLVIII., p. 480) thinks, from study of 66 cases of vulvovaginitis in girls of from three weeks to twelve years, that the most frequent source of infection is from child to child and that the most common manner of its transmission is through the school lavatory. As special precautions for its prevention he advises: (1) the instillation of a drop of 2 per cent. silver nitrate solution in the vestibulum vaginæ of all newborn girls whose mothers show evidence of gonorrhea, though probably not over 5 per cent. of the cases of vaginitis are infected at birth. (2) Making vaginitis in children a disease reportable to the Board of Health. (3) Instruction of parents of infected children through the visiting nurse regarding preventive measures to limit the infection, including the use of separate towels and wash-cloths, sleeping in a separate bed, care as to cleansing contaminated clothing, and special precautions in the use of the lavatory. (4). Investigation by the visiting nurse as to the probable origin of the infection in each case with a view to excluding this factor from contaminating other children in the same house. (5) The adaptation of a U-shaped seat with low bowl and other precautionary measures to prevent the spread of infection through the public lavoratories in schools, playgrounds, comfort-stations and tenements. Children cannot be relied upon to use paper coverings for lavatory seats, so the U-shaped seat should be used in addition. The height of the bowl should not be over eight inches where the lavatory is to be used by children of school age.—*The American Journal of Obstetrics.*

CLINICAL DISTINCTIONS BETWEEN CEREBRAL INTOXICATION; MENINGISM (SEROUS MENINGITIS), AND MENINGITIS*

BY HENRY HEIMAN, M.D.

New York City

Very often the most extraordinary diagnostic acumen will not suffice to interpret properly certain meningeal symptoms without days of clinical and laboratory observation. It is safe to say that every pediatrist has observed patients suffering from all the symptoms and signs of meningitis, develop a small patch of dullness with bronchial breathing at the apex or sometimes at the base of the lung, or a diffuse scarlatinal rash, or a positive Widal reaction. It is extremely important, therefore, both from a diagnostic and a prognostic viewpoint, to recognize, if possible, the distinctions between meningitis and conditions simulating it.

Let us attempt, first of all, to define the terms used in the title of this paper. Cerebral intoxication is the condition produced by the absorption of toxins derived from bacterial or physicochemical agents, or from animal or vegetable matter; and characterized by irritative phenomena, such as delirium, restlessness, involuntary muscular movements, etc. It is fairly frequent in the severe infections, and occasionally produces signs which warrant the tentative diagnosis of a complicating meningitis. The term meningism, or so-called serous meningitis, is applied to a morbid process resembling meningitis in its manifestations, but in which the spinal fluid is sterile. In true meningitis bacteria may be demonstrated, as a rule, in the spinal fluid.

Cerebral Intoxication—Confining our subject to pediatrics, we find evidence of cerebral involvement in many of the infectious diseases. In our opinion, pneumonia stands at the head of the list in the matter of cerebral complications. Typhoid fever, influenza, scarlet fever, acid autointoxication and other diseases and conditions, have a similar tendency to develop secondary meningeal symptoms. The most striking illustrations of cerebral intoxication may be found in the severe cases of typhoid fever and pneumonia, where delirium, photophobia, retraction and rigidity of the neck, twitching of the muscles, and even generalized convulsions, occur. In practically all of these cases autopsy reveals no lesions of the cerebrospinal system. Occasionally we discover a real typhoid meningitis or encephalitis; according to Osler, meningitis occurred in only 11 of the 2,000 cases during the Munich epidemic. In pneumonia, meningitis is somewhat more common, and is probably the most serious complication. The diagnosis of a true meningitis in pneumonia is difficult, as the lesion is usually on the convexity of the brain and consequently may give no local signs. In the great majority of pneumonia cases, however, the meningeal symptoms, although severe, subside with the advent of the crisis, thus proving that they were merely evidences of a profound toxemia. In influenza, the most pronounced symptoms of cerebral intoxication may occur without definite lesions in the brain or meninges. True encephalitis and meningitis, however, are occasional complications. In the acute exanthemata, especially scarlet fever, manifestations of cerebral intoxication are frequent; but here it is seldom that we are compelled to differentiate between cerebral intoxication and meningitis, as the latter is very uncommon.

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*Read before the Pediatric Section, New York Academy of Medicine, April 8, 1915.

In distinguishing clinically between cerebral intoxication and meningitis, the following points must be borne in mind:—

(1) In intoxication there is always an etiologic factor, to which the meningeal signs are secondary. Occasionally the cause is difficult to find, but thorough investigation and observation will often reveal one of the infectious diseases or other causal factors.

(2) The signs in cerebral intoxication are significant of a general cerebral irritation; in primary meningitis there are, in addition, distinct focal signs. In intoxication we may have headache, photophobia, delirium, muscular twitchings, possibly general convulsions; in meningitis we may also have ptosis of the eyelids, unequal pupils, strabismus, facial palsy, even hemiplegia and other focal manifestations.

(3) Lumbar puncture is, of course, the most important and definite means of differentiating the two conditions. In intoxication the fluid is sterile and clear; in meningitis bacteria will, in most cases, be found in the fluid either by smear or culture, and the appearance of the fluid is changed from the normal. The cytologic examination of the fluid is also significant, as in the intoxication cases no variation from the normal occurs, whereas in meningitis various changes are present, depending upon the type of the infection, *i.e.*, whether meningococcal, pneumococcal, influenzal, tuberculous, etc.

When the ordinary clinical and laboratory methods are not sufficient to distinguish between the two above-mentioned conditions, lumbar puncture is not only justifiable but necessary, even in the presence of an acute infection like pneumonia or typhoid fever. The procedure itself is harmless, except in very unusual cases, and is of the greatest diagnostic value.

Meningism—Meningism is a term first proposed by Dupré at the Medical Congress in Lyons in 1894, to include all those cases clinically resembling meningitis, but in which lumbar puncture reveals sterile fluid. Bouchut called this condition pseudomeningitis and Quincke, serous meningitis. Schulze, Kraunhals, Kohts, Strümpell, Lepine and others have also studied this subject extensively. Its causes may be classified as (1) infectious or toxic, (2) irritative, (3) reflex, (4) hysterical.

Practically all the infectious diseases that produce cerebral intoxication may, where the toxins have a greater predilection for the nervous system, cause meningism. The term indicates, in our opinion, merely a greater degree of cerebral toxemia than we find in the condition called cerebral intoxication, and differs from it only by showing evidence of increased intracranial pressure and by a symptom-complex which still more simulates the true meningitis. Among the most important of the infectious causes of meningism, may be mentioned acid autointoxication or acidosis, which is fairly frequent in children and may be mistaken for meningitis, especially on account of the stupor, vomiting, and other meningeal symptoms. Here the differential diagnosis must be made chiefly by the frequent observation, and by lumbar puncture if necessary. Here we may also mention meningism occurring in the later stages of gastroenteritis, where the meningeal symptoms may be so marked as to point to a diagnosis of tuberculous meningitis.

Of the irritative causes of meningism we find: (1) Head injuries, which frequently produce meningeal symptoms, even after the signs of the acute concussion or contusion have disappeared; (2) some subacute or chronic ear conditions; and (3) operations on the cranium or upon the venous sinuses.

Under reflex causes of meningism we may include helminthiasis as a possible factor.

The hysterical type of meningism is mentioned extensively in the French literature. These are the cases which the French claim are occasionally mistaken for tuberculous meningitis; some observers even go so far as to regard those cases of so-called cured tuberculous meningitis, where the bacilli were not found, as belonging to this class. Aporti believes that these are not hysterical or psychogenic in nature, but rather toxic or infectious in origin.

The points of difference between meningism and meningitis are: (1) The presence of one of the above-mentioned etiologic factors in meningism. (2) The transitory character of the symptoms in meningism, *i.e.*, the subsidence of the signs when the etiologic condition improves. (3) The ophthalmoscopic findings. In meningism we rarely find any ocular changes, except possibly a slight congestion of the discs; in meningitis the changes, if present, are usually much more pronounced. (4) The bacteriologic and cytologic findings in the cerebrospinal fluid in meningitis. This of course must be regarded as the most important differential sign.

In dwelling upon the differential diagnosis between meningitis and the conditions simulating it, it might be well to mention several other, somewhat rarer diseases, as follows: (1) Pachymeningitis hemorrhagica interna. This was first described by Finkelstein in 1911 and subsequently by Rosenberg. It is an acute condition, characterized by a rapid enlargement of the head, with acute meningeal symptoms of varying intensity. The distinguishing features of this disease are, punctate or striate hemorrhages in the retina, and the occurrence of hemorrhagic fluid on puncture of the anterior fontanel, while the spinal fluid remains clear. The etiology of this condition is supposed to be a pre-existing hemorrhagic rhinitis of diphtheritic or streptococcic origin. (2) Pachymeningitis interna luetica, first described by Heubner. (3) Encephalitis. In infancy and early childhood it is practically impossible to distinguish this condition from acute meningitis except by lumbar puncture. Encephalitis occurs occasionally in premature infants and is supposed to be due to sepsis. In infants it is of very sudden onset, of short duration, and is almost invariably fatal; in older children, where it is likely to follow one of the infectious diseases, the prognosis is much better, as the lesion is usually more circumscribed.

In conclusion let us state that this is essentially a clinical paper, and was not written with the idea of covering the subject of meningitis or analogous diseases, but to help clarify, in our minds, the distinctions between meningitis and conditions with which it is often confused. The diagnosis of the various conditions, we realize, is not always easy, as often one shades into the other by slight gradations; but we trust the points given above may be of some service in the matter of differential diagnosis.

30 West Eighty-eighth Street.

MENINGITIS IN THE NEWBORN, WITH REPORT OF A CASE*

BY CHARLES HERRMAN, M.D.

New York City

Meningitis in the newborn is rare. In an incomplete search through the literature I have been able to collect only 8 cases with postmortem and bacteriologic examination. Two of these (Reuss, De Bruin) are only mentioned as having occurred without any further details.

Scherer: Jahrb. f. Kinderhk., 1895, Vol. XXXIX., p. 1. The patient was admitted to the hospital when nine days old. Mother healthy and had plenty of breast milk. Infant very weak, jaundiced. Lost rapidly in weight, had vomiting, diarrhea. The temperature ranged between 38° and 40° C., but on the day of its death, when eighteen days old, the temperature was normal. There were a few râles in the chest and the abdomen was distended. *The diagnosis was acute gastroenteritis.* Postmortem examination showed a thick, yellowish-green, purulent exudate covering the convexity and base of the brain. Similar pus was found in both ears. Bacterial examination of the meningeal exudate: Bacterium coli.

Hinsdale: Lancet, London, 1899, p. 1,030. A newborn died on the thirteenth day. The mother had uterine trouble. The infant was emaciated, continued to lose weight, had convulsions, nystagmus, retraction of the head and a temperature of 103°F. The umbilical cord was fetid. Postmortem examination showed a purulent exudate covering the surface of the brain. Bacterial examination: Bacterium coli.

Scheib: Prag. med. Woch., 1900, p. 169. An infant eight days old, one of twins, died *without any special symptoms,* the *diagnosis* being *congenital debility.* Postmortem examination showed purulent meningitis, purulent otitis, atelectasis. Bacterial examination of the meningeal exudate showed Bact. lactis aerogenes.

Goldreich: Jahrb. f. Kinderhk., 1902, Vol. LVI., p. 808. An infant *asphyxiated* at birth had convulsions twenty-four hours later. Jaundice, cyanosis of the lips and extremities, a prominent anterior fontanel, diarrhea, irregular respiration, a weak heart, some retraction of the head and a temperature of 37°C. (98.6°F.). It died twenty-four hours later. Postmortem examination showed an acute fibropurulent meningitis, a purulent pleuritis, bronchitis. The nose, ears and navel were normal. Bacterial examination: Bacterium coli.

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* Read at the Annual Meeting of the American Pediatric Society, at Lakewood, N. J., May 25, 1915.

Benfey: Med. Klinik., 1907, Vol. XL., p. 1,199. A newborn on the seventh day refused to take the breast and had a slight spastic condition of the jaw and of the extremities, convulsions, Cheyne-Stokes respiration and a temperature of 37.8°C. (100°F.). Died on the following day, the temperature rising before death to 40°C. (104°F.). Postmortem examination showed a suppurative meningitis. Bacterial examination: Bacillus pyocyaneus.

Bonhoff and Esch: Zeitschr. f. Geburtsh. u. Gynaek., 1912, Vol. LXX., p. 886. An infant nine days old showed a slight rise of temperature. On the eleventh day the temperature rose to 39.8°C. (103.8°F.), and it died with convulsions on the fourteenth day. Postmortem examination showed a purulent meningitis and otitis. Bacterial examination: Bacterium mucosus capsulatus.

My own case was as follows: J. F., born in the Lebanon Hospital on November 13, 1914; morphin-scopolamine amnesia. The mother is healthy and has two healthy children. The labor was easy, not protracted and non-instrumental; the baby was not asphyxiated and weighed 5 pounds, 6 ounces at birth. It was breast-fed and while in the hospital presented no unusual manifestations. Mother and baby left the hospital on November 25th, the latter weighing 5 pounds, 8 ounces. On the day following the baby refused to take the breast; there was constipation and retention of urine. It was admitted to my service on November 29th. On examination it was found that the infant was somewhat cyanotic, limp and apathetic. The physical examination showed nothing abnormal; there was no vomiting, no prominence of the anterior fontanel, no retraction of the head, no spasticity of the extremities, in fact no symptoms which would have suggested the possibility of a meningitis, so that a lumbar puncture was not made. At 6 P.M. the temperature was 96°, at 9 P.M. 96.2°, at 12 P.M. 96.4°; from that time the temperature became so subnormal, notwithstanding the application of hot-water bags, that it could not be registered on the clinical thermometer. The child became more cyanotic, the breathing became irregular and it died at 5 P.M. on November 30th.

Postmortem examination by Dr. Riegalman, coroner's physician, showed a female infant fairly well nourished, abdomen somewhat distended. On opening the skull a thick, yellowish-green exudate was found covering the anterior surface and the base of the brain. This exudate was not uniformly distributed, but was more distinct at certain points. There was an increased amount of fluid in the ventricles. The exudate appeared to extend to the cord. The thymus was small, about the size of a lima bean. Heart and lungs normal. Stomach dilated and contained a few curds of milk. Liver, spleen, kidney and intestine normal. Unfortunately, no special examination of the ears or nasal sinuses was made. Microscopic examination of a section of the brain covered by the pyogenic membrane showed that the parenchyma was infiltrated with numerous round cells and the vessels were injected. The lungs were congested and many air vesicles were filled with blood and endothelial cells. The thymus, stomach, liver and spleen showed nothing abnormal. Cultures made from the meningeal exudate showed the pneumococcus (Dr. Bernstein).

The case is interesting because, as far as I could ascertain, it is the only case of pneumococcus meningitis in the newborn reported; on account of the absence of fever and later the marked subnormal temperature; and on account of the entire absence of meningeal symptoms, so that the necessity for a lumbar puncture was not even thought of.

The primary infection in these cases of meningitis in the newborn may take place: first, through the placental circulation. This is probably exceedingly rare, since the normal placenta acts as a filter and usually prevents the passage of infectious material. It is only when it is diseased or partially detached that such material enters the fetal circulation. Second, in cases of difficult labor there may be premature respiration of the infant (in utero) resulting in the swallowing or aspiration of contaminated amniotic fluid. This is most likely to occur in partially asphyxiated infants and when there is a premature rupture of the amniotic sac. Third, infection may take place at birth through an injury to the skull. Fourth, after-birth infection may take place through the eyes, nose, throat, ears, gastrointestinal tract, umbilicus or genitals. From the fact that the Bacterium coli is the most common causative agent in these cases, it is highly probable that the infection frequently takes place through contaminated water in the bathing tub. These organisms entering the nose, throat or ears may cause an otitis or sinusitis which may result in an infection of the meninges; in some cases the infection of the meninges probably takes place through the circulation, for example in Hinsdale's patient in whom the primary focus was in the umbilicus. The frequency of otitis in these cases is worthy of special mention. A number of authors (Tröltsch, Wreden, Netter and Rasch) have called attention to the fact that otitis is found postmortem in a very large percentage of infants dying from various causes in whom no indication of involvement of the ears was present during life.

250 West Eighty-eighth Street.

STRANGE ASPECTS OF WHOOPING-COUGH—P. H. Sylvester (Boston Medical and Surgical Journal) states that the death of a child from any cause is a tragedy; but one is liable to lose sight of this fact in the sudden, unexpected, or dramatic death of an unusual case. Whooping-cough, with a mortality of approximately 7 per cent., and a toll of 10,000 in the United States annually, presents an appalling contrast to the layman's, and the average physician's conception of its harmlessness. The causes of death in whooping-cough are, briefly, exhaustion, pneumonia, bronchopneumonia, heart failure, and terminal tuberculosis. The cases which the author describes are of interest owing to their unusual type and provide an argument for an efficient treatment of, as well as prophylaxis against, the disease. Six of the eight cases reported were much alike. The author concludes from his experience that certain cases of whooping-cough have symptoms of intracranial pressure, best explained on the ground of a cerebral hemorrhage. The hemorrhage appears to be dependent upon the stress of a severe paroxysm. The symptoms of hemorrhage in these cases pointed to lesions other than middle meningeal and were surprisingly uniform in the initial convulsion, immediate rise in temperature to a high degree, cyanosis and spasticity rather than paralysis. This type of cases emphasizes the importance of prophylaxis. Treatment should be directed toward at least reducing the severity of the paroxysms.—*Medical Record.*

CONGENITAL DEPRESSIONS OF THE SKULL

BY A. L. GOODMAN, M.D.

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Although as a rule this condition has no great clinical significance, it may at times be of interest from a medico-legal standpoint, and it is for this reason, as well as its comparative rareness, that I desire to call attention to the subject.

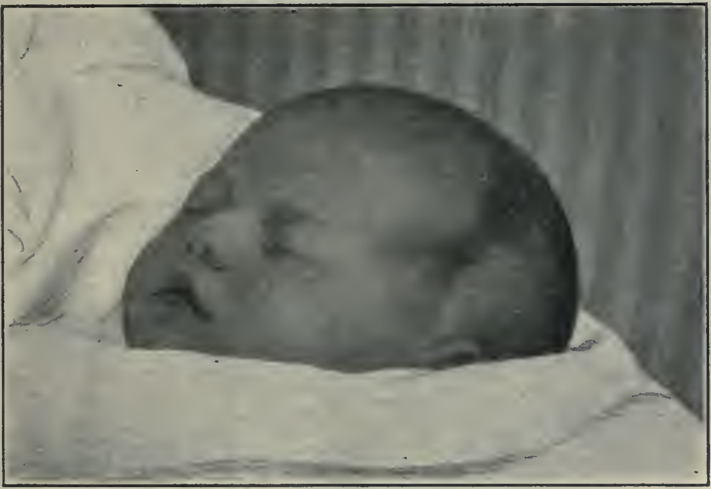
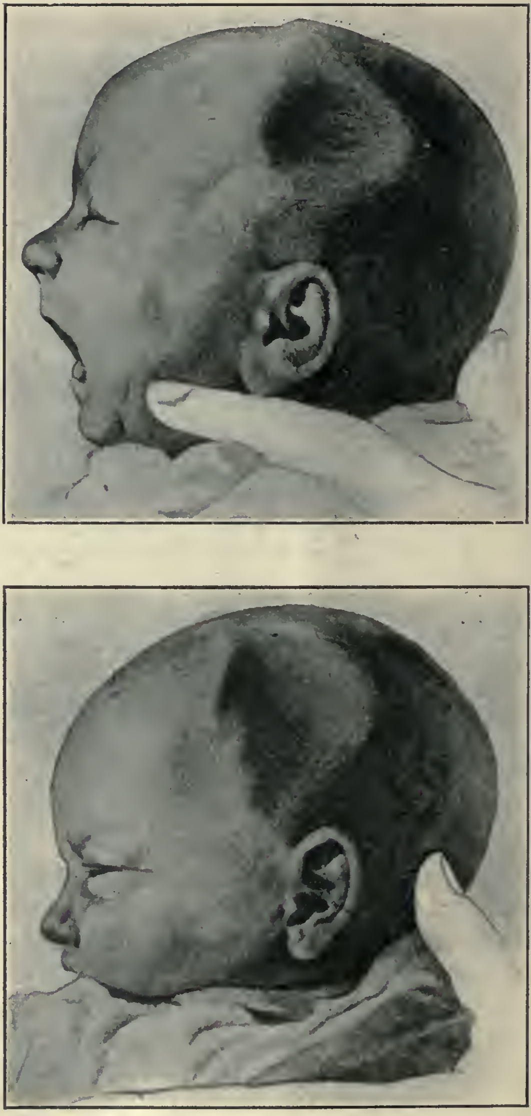


FIG. 1—Author's case, showing congenital depression of skull anterior and above ear

During the past winter I had occasion to see 3 such cases. It usually causes a great deal of anxiety to the parents, who fear that a child will grow up with a deformed skull. They are also very sensitive about the condition, and in 2 cases I was unable to obtain their consent to have the child photographed. The third case was the second child of the same mother born with this defect. As the first child was five years of age and had had a similar defect which it had outgrown, the mother was not anxious about this abnormality. She finally consented to have a photograph made, a copy of which accompanies this article, as well as two reproductions from Bumm's Text-Book.

It often takes a great deal of persuasion to convince the parents that the child was not roughly handled during labor or af-



Reproductions of illustrations from Bumm's text-book, showing typical cases of congenital depression of skull terward, and that it was not due to either the carelessness of the physician or the nurse, but that the condition existed before the baby was born.

In the 3 cases seen by me, the labor had been normal, of short duration and without instrumentation. It can be readily seen that where this condition exists and instruments have been used, it offers an opportunity for a suit of malpractice when the accoucheur is not at fault.

Its origin may be due to a softened condition of the cranial bones in utero and an anomaly in the formation of the bones of the pelvis. The most usual cause is a pressure of the cranial bones upon the promontorium. It is rarely due to any deformity of the symphysis.

The situation of these depressions is usually the parietal bones, although they do occur on both the temporal and occipital bones.

The depressions assume various shapes, but the character of these indentations is most frequently spoon-shaped or angular.

In most of the cases reported there is no accompanying symptomatology. The depression causes the child no inconvenience, and there is no local sensitiveness present. In a few exceptional cases cited, the depression is said to have caused severe cranial hemorrhage with ensuing death.

As a rule, the depressions gradually disappear with the filling out of new bone, and at about the third or fourth year the head may once more assume its normal shape. It is only rarely that the depression remains and the child retains a somewhat deformed skull without any clinical symptoms.

In exceptional cases, where the depression has assumed the form of a very deep indentation, it may become necessary to resort to some surgical interference in order to pull out the depression and have the bone assume the normal contour. For this purpose a small hole is made in the depressed part of the bone by a small trephine, and through an opening in the skull a blunt retractor is placed and by gentle traction the bone gradually pulled to its normal shape. It has also been suggested to replace the depression by taking the child's head in the hands and by gentle pressure around the edges of the depression to manipulate the bone back to its normal shape. Unless, however, there is some urgent indication, I should earnestly advise that these cases be left alone for, as a rule, they do well without any interference.

SOME EXPERIENCES WITH FRIEDENTHAL MILK*

BY EDWIN A. RIESENFELD, M.D.
Adjunct Attending Physician to Hebrew Infant Asylum, New York

The efforts to so modify cow's milk as to resemble breast milk in composition have been practically negligible during the last decade. The results obtained were very poor and the method has fallen into disfavor. The excellent results obtained by the so-called "Heilnahrungen" buttermilk, malt soup and eiweissmilch[1] in the digestive disturbances of infancy are well known, but to continue this dietary over a prolonged period is to defeat its own purpose. It is evident, then, that there is a great necessity for a milk mixture in the feeding of infants who are denied breast-milk which shall be of sufficient caloric value and which may be used indefinitely without harmful effects—a food which shall be simple in preparation and which will not require a continuous changing of its component parts to meet the various demands of a normally developing infant.

To meet the urgent demands placed upon us in the feeding of infants through a critical period, it frequently becomes necessary to resort to the breast milk obtained from a wet nurse. This is so, not only in private practice but in large institutions harboring a great number of infants.

Realizing the dangers and difficulties attendant upon such a course, Friedenthal,[2] of Berlin, set about the preparation of a milk mixture which should more nearly resemble breast milk than any in use at the time. Appreciating the radical differences in the fat and proteid present in breast milk as compared to cow's milk, and realizing that there is an entire absence of those enzymes known to be present in breast milk, he urges[3] that the greatest attention be given to the salt content of a milk mixture intended for infant feeding. Frequent examinations have shown that there is a difference of 50 per cent. or more in the total quantity of ash in cow's milk, but that there is a definite and constant relation existing between the various salts composing the salt content of the milk.[4] It is a simple matter to reduce the ash content of cow's milk to the amount found in breast milk, but a mixture of one-third or one-half milk would reduce the potassium salts to an extremely small amount. On the other hand, to approximately reduce the calcium salts to the amount found in breast milk would require a dilution of from 1 to 6 at least. To so modify cow's milk that its ash content even approximately resembles breast milk, is a task fraught with many difficulties.

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* From the service of Dr. S. V. Haas, Hebrew Infant Asylum, New York City.

When we bear in mind the small amount of consideration which has been given to the salt content in our dilutions of cow's milk for infant feeding and the failures which many of us have had, would it not seem reasonable to suppose that, in a measure, at least, the failures may have been due to this oversight?

Friedenthal believes that great attention should be given to the ash contents of *all* foods given to children during the first three years of life.[5]

Friedenthal's formula is as follows:—

Skimmed milk	330 c.c.
Water	660 "
Lactose	68.9 gm.
Molkerei salts	1.89 "
Fat (in cream) to	4.5%

The Molkerei salts are composed of—

Pot. chlorid	2 parts
Pot. phosphate	1 part
Pot. biphosphate	1 "

The caloric value of this food is 770 c.c. per liter.

In our experiments a good grade of milk was employed, and, consequently, was neither pasteurized nor boiled. With the Friedenthal milk in its original form our results were not encouraging. When, however, the lactose in the mixture was replaced by cane sugar or dextri-maltose, the gain in weight became satisfactory.

It is interesting to note that Schloss[6] reports equally poor results with the mixture containing lactose, and produced a modified mixture which he called "whey modified milk." Bahrt[7] used the original formula in a series of 150 infants with much better results, however, than Schloss obtained.

In our own experiments the infants were all inmates of an institution, and ranged from two weeks to seven months of age. The milk was given in quantities rarely exceeding 40 ounces in twenty-four hours, usually 6 ounces at a feeding.

Twenty-one infants were placed upon Friedenthal milk and observed for periods ranging from three to twenty-five weeks. During this time 5 of the children died, the causes of death being diseases not referable to the gastrointestinal tract. Many of the infants vomited frequently and had poor stools occasionally, during the feeding experiment, but as there was no other evidence of a gastrointestinal upset we found no occasion to alter the feeding during this period. The stools varied from the ideal stool of a breast-fed infant to the green, lumpy type with occasional shreds of mucus.

The average gain in weight of the 21 children under observation for a period longer than three weeks was a little over 4 ounces per week. Those under five months of age made a more rapid gain than the older infants.

An individual report of the 21 cases is given below:—

CASE 1. Age, two months; weight, 10 pounds, 3 ounces. Previous feedings, breast and bottle (formula unknown); Friedenthal milk given for twelve weeks. Total gain in weight, 2 pounds. Stools varied, occasionally lumpy. No vomiting. During an attack of varicella infant gained 2 ounces during week of illness.

CASE 2. Age, three months; weight, 11 pounds, 11 ounces. Previous feeding unknown. Infant is of the exudative diathesis type. Friedenthal milk given for a period of twelve weeks. Total gain in weight, 3 pounds, 13 ounces, an average of 4½ ounces per week. Stools were poor at beginning of period, later becoming normal. Infant appeared normal when last seen.

CASE 3. Age, four months; weight, 8 pounds, 12 ounces. Previous feedings not known. Friedenthal milk given for a period of fifteen weeks. Total gain, 3 pounds, 10 ounces. At eight months infant had a severe attack of varicella with stationary weight during illness. At last observation (ten months) infant is still under weight but gaining steadily. Mixed feedings given after the eighth month.

CASE 4. Age, six months. Well-developed healthy infant. Friedenthal milk given for three weeks. Total gain in weight, 1 pound. Stools excellent throughout. No vomiting. Friedenthal milk discontinued and simple milk mixtures substituted. Infant gained 1 pound in the following month.

CASE 5. Age, five months; weight, 10 pounds. Previous feedings not known. Poorly nourished infant with general glandular enlargement and palpable spleen. Non-specific. Friedenthal milk given for a period of eleven weeks. Total gain of 4 pounds, an average weekly gain of almost 6 ounces. Marked improvement in the general condition. Stools normal. No vomiting. At seven months infant had an attack of varicella, characterized by persistent high temperature. Weight, stationary for three days. During convalescence there was a gain of 20 ounces in the next four weeks.

CASE 6. Age, two and one-half months. Previous feedings, milk and water mixtures (formula unknown). Marked eczema about head and face. General glandular enlargement. Milk and water feeding continued during first two weeks in institution with a gain of 1 pound. Friedenthal milk was then substituted and infant gained 17 ounces during the following week. Stools often poor. No diarrhea. Vomited frequently. Total gain during twenty-one weeks of observation, 6 pounds, an average of over 4 ounces per week. Following a severe attack of varicella at six months there was a gain of 2 pounds, 10 ounces in five weeks. General condition of child at eight months is excellent.

CASE 7. Age, three months; weight, 8 pounds, 12 ounces. Previous feedings, milk and water mixtures. Very small atrophic infant. Friedenthal milk given for a period of nineteen weeks. Total gain, 8 pounds, an average of almost 7 ounces per week. During an attack of varicella there was a gain of 6 ounces during the week of illness.

CASE 8. Age, three months; weight, 6 pounds, 8 ounces. Poorly-nourished, rachitic infant. Stools poor on admission. Friedenthal milk given for thirteen weeks. Total gain, 3 pounds, 10 ounces, an average gain of 4½ ounces per week. Gained 4 ounces during the first week. At six months is still undersized, but gaining steadily, and seems to be healthy. Stools became normal during the second week. No vomiting.

CASE 9. Age, four and one-half months; weight, 11 pounds, 2 ounces. Previous feedings, whey modified milk. Infant gained 11 ounces in four weeks on this mixture. Infant of the exudative diathesis type. Given Friedenthal milk for a period of twenty-one weeks. Total gain, 4 pounds, or an average of 3 ounces per week. Occasionally constipated. No vomiting. This infant had repeated attacks of influenza during observation, with stationary weight during each attack. Lost 4 ounces at five months during an attack of varicella, but regained it while still ill.

CASE 10. Age, two weeks; weight, 7 pounds, 8 ounces: Well-nourished infant. Friedenthal milk given for a period of seventeen weeks. Total gain, 5 pounds, 12 ounces, an average of 5½ ounces per week Gained 2 ounces during an attack of influenza at three months. Lost 4 ounces during an attack of varicella at five months, but regained it while ill.

CASE 11. Age, 2 months; weight, 8 pounds, 1 ounce. Previous feeding, breast milk. Small marasmic infant. Friedenthal milk given for eighteen weeks. Total gain, 4 pounds, 13 ounces, an average gain of 4 ounces per week. Stools occasionally green and lumpy. Vomited whenever quantity was greater than 3 ounces in each feeding. At three months had an attack of varicella, sustaining no loss in weight. This infant gained steadily and at six months, while still under weight, is steadily gaining.

CASE 12. Age, five months. Previous feedings, breast milk; breast milk supplemented by whey modified milk. During this time stools were poor, infant vomited frequently and there was no gain in weight. Eiweissmilch (2 per cent. sugar) was then given. The gastrointestinal symptoms cleared up and infant was given Friedenthal milk, gaining 1 pound during the following six weeks. At seven months infant was given, in addition to Friedenthal milk, cereals and vegetable purees. Weight remained stationary during the following two weeks with gradually developing anorexia. Severe vomiting and diarrhea followed, improving under appropriate treatment. Infant was given Friedenthal milk exclusively, with a gain of 14 ounces during the next two weeks. This gain was followed by stationary weight for one week. Was then given a milk and water mixture containing 2-3 per cent. sugar and made a rapid and continuous gain in weight. This infant showed a marked carbohydrate intolerance.

CASE 13. Age, two months; weight, 8 pounds, 4 ounces. Previous feedings, milk and barley water mixture with a total gain in weight of 14 ounces in five weeks. Friedenthal milk given, followed by a gain of 2 pounds in four weeks. Stools normal. No vomiting. At five months had an attack of bronchopneumonia lasting four weeks. Lost 8 ounces. At six and one-half months had a severe attack of varicella with no loss of weight. Upon admission this infant was very poorly developed and had marked eczema and intertrigo. Following the varicella there was a distinct improvement in the eczema. This infant gained 4 pounds, 1 ounce during the period of observation, but at nine months is still undersized.

CASE 14. Age, ten days; weight, 7 pounds. Previous feedings, whey modified milk with continuous and violent vomiting after each feeding. Examination revealed pyloric spasm. Infant was then given a very dilute milk and water mixture, with treatment directed to the relief of the gastric condition. Vomiting ceased. Although milk mixtures were increased in strength, there was a gain of only 14 ounces in the following two months. Breast milk was then given, followed by a gain of 8 ounces in three weeks. Friedenthal milk given at 2½ months for a period of twenty-one weeks. Vomiting had ceased during breast-milk period. Total gain during Friedenthal period, 6 pounds, 4 ounces, an average of 4½ ounces per week. There was a gain of 1 pound during the first two weeks. At eight months infant weighs 15 pounds, is well developed and does not vomit.

CASE 15. Age, two months; weight, 10 pounds, 4 ounces. Normal infant. Previous feeding, breast milk; milk and water mixtures for two months, with a gain of 2 pounds. Friedenthal milk given for a period of twenty-one weeks. Total gain in weight during this period, 5 pounds, 6 ounces, an average of 4 ounces a week.

CASE 16. Age, six months; triplet; weight, 10 pounds. Poorly-nourished, marasmic infant. Weighed 4 pounds at one month. Previous feedings, whey modified milk with a gain of 5½ pounds in six months. Friedenthal milk given, followed by a gain of 1 pound, 14 ounces in the next two weeks. At eight months infant had a severe attack of bronchopneumonia, which persisted for two months, with a loss of 1 pound during illness. Total gain during nineteen weeks of observation, 2 pounds, 8 ounces. Since the ninth month has had other food in conjunction with the Friedenthal milk. At eleven months weighs 12 pounds, 8 ounces.

CASE 17. Age, four months; weight, 14 pounds, 4 ounces. Well-developed infant. Given Friedenthal milk for ten weeks. Total gain, 2 pounds, 8 ounces, an average of 4 ounces per week. Stools normal. No vomiting. Weight normal at ten months.

CASE 18. Age, five and one-half months; weight, about 4 pounds. Poorly-developed, rachitic infant. Whey modified milk given for five months, with a gain of 4½ pounds in weight. Friedenthal milk substituted, with a gain of 4 pounds in fourteen weeks. Stools normal. No vomiting. Following a period of one week, when weight remained stationary, infant was given milk and barley-water mixtures, with a gain of 2 pounds in seven weeks. At ten months weighs 14 pounds, 8 ounces.

CASE 19. Age, one month; weight, 8 pounds, 6 ounces. Previous feedings unknown. Friedenthal milk given for two months, with a gain of a little over 2 pounds in weight. Stools were good. Vomited at least once each day. Gain in weight steady and uniform throughout.

CASE 20. Age, three months; weight, 9 pounds, 10 ounces. Poorly-nourished, rachitic infant. Previous feedings, milk and water mixtures. Friedenthal milk given for a period of seven and one-half weeks, with an average gain of 4½ ounces each week, when the infant was discharged from the institution and lost to observation.

CASE 21. Age, three months; weight, 10 pounds. Poorly-developed infant. Was given Friedenthal milk, followed by severe vomiting and constipated stools. During the following two weeks there was a loss in weight of 24 ounces; a rise in temperature; the infant became very pale; the fontanels sunken, respiration labored and slow; pulse low. Albumin and sugar were present in the urine. Acetone reaction not ascertained. Friedenthal milk was discontinued and under appropriate treatment the condition improved. Eiweissmilch was substituted, with a gain of 14 ounces in one week. Friedenthal milk was again given for a period of twenty-four hours, followed by a loss in weight and a return of the previous symptoms. Friedenthal milk was again discontinued and skimmed milk given, followed by a gain of 1 pound in three weeks. Any attempt to increase the fat content was followed by stationary weight or a loss in weight. For the past three months infant has been given eiweissmilch containing 5 per cent. sugar and has made a steady gain in weight. At seven months weighs 14 pounds, 4 ounces. This infant showed a definite fat intolerance.

SUMMARY

(1) In Friedenthal's modification of milk we have a food that can be administered throughout infancy and without change, except in the amount given.

(2) Of the 21 infants placed upon Friedenthal's milk, 19 made a steady and normal gain in weight, with an average of 4 ounces per week, infants under three months of age making the greater progress. The 2 infants who failed to gain showed a marked intolerance for the high fat and sugar content of Friedenthal's milk and could only be given any food containing low quantities of sugar and fat.

(3) Friedenthal's milk may be given throughout an acute illness without modification, the majority of children making a gain in weight during the illness.

(4) The occurrence of vomiting and poor stools is not incompatible with a gain in weight.

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STREPTOCOCCIC PERITONITIS OF GENERAL ORIGIN—Henri Schwers (Arch. de mèd. des Enf., June, 1914) says that most cases of peritonitis in infants are the result of perforation of the gastrointestinal tract, especially of the appendix. Adnexal peritonitis is not rare, having as a cause a vulvovaginitis. Generally the infecting organism is the gonococcus, but it may be the pneumococcus, or other diplococcus. Peritonitis is rarely, however, of genital origin in a child. The author describes a case in which the infection was streptococcic and came directly from the genital organs.—*The American Journal of Obstetrics.*

SOCIETY REPORTS

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS

Stated Meeting, Held April 8, 1915

Walter Lester Carr, M.D., Chairman

ANTI-MUMPS INOCULATION

Dr. Alfred F. Hess said that it was well known that an attack of mumps conferred immunity on the subject. A person rarely got mumps a second time. This had been the general experience and it had been his in the Hebrew Infant Asylum. During the winter of 1912-13 there had been an epidemic of mumps in this institution in which there were 100 cases of the disease. This winter there had been a smaller epidemic of 80 cases. None of the 100 children who had the disease in 1912-13 had the mumps during the epidemic of the past winter. In trying to find a prophylactic for mumps it was evident, since the organism causing mumps had not been isolated, that they could have no vaccine or serum, but in view of the fact that immunity was acquired by having the disease it seemed that they might hope to confer immunity by the use of blood from patients convalescing from mumps. In the Hebrew Infant Asylum they had the advantage of knowing the past history of the children with considerable exactness and knew just what diseases the children had had. They inoculated 20 children whom they were sure had not had mumps before with the blood of convalescent patients, using 6 to 8 cm. of blood from the vein of the elbow of the donor and injecting it intramuscularly. These 20 children were divided into three groups. Four of them were inoculated with blood from patients who had just recovered and in whom there was still some swelling of the parotid. A second group were inoculated with blood from patients about ten days recovered from the disease, while in the third group blood from children who had had the disease several years ago was used. The injections were made when the epidemic had reached considerable proportions. All of the children were then put into the mumps ward and then transferred to other wards in which mumps had developed. Dr. Hess exhibited charts showing the number of cases of mumps in the different wards and the number of inoculated children exposed in these various wards. In all of the wards mumps occurred to a considerable extent after the children were exposed, but not one of the inoculated children contracted the disease. Three children out of the 20 inoculated were put into wards where there were no mumps and, of course, these had to be excluded from the series. In one ward 11 susceptible children took the disease while no inoculated child did so. The same fact was shown throughout the series. The same result seemed to be shown where the children were inoculated with blood from those who had had the disease several years ago as when the blood of recent convalescents was used.

As a result of the inoculations Dr. Hess said he felt that the epidemic had been limited; they had not had a case now for a month. He was convinced that this was a simple method of preventing the spread of mumps in an institution. Of course in choosing the convalescent donors they would have to exclude syphilis. The method was also applicable in a family where one child had the disease. As the incubation period of mumps was long, being eighteen days, the injection could be given to other children in the family with every prospect of averting the disease. The length of time during which the immunity lasted had not yet been determined, but it very probably lasted throughout the period of exposure. On the whole, he thought it was perhaps better to take the blood from the more recent convalescents rather than from those who had had the disease several years before.

Dr. Samuel Feldstein, of Brooklyn, asked Dr. Hess whether he had any records of the inoculated cases as having been in beds adjoining the cases that contracted mumps.

Dr. George Dow Scott asked Dr. Hess if the blood of the patients having had mumps some months or years previous was less efficacious than the blood of patients who had recently had the disease.

Dr. Walter Lester Carr asked whether the children who were inoculated developed any constitutional disturbances or whether any local reaction was observed.

DR. ALFRED F. HESS, in closing the discussion, said there had been no local and no constitutional reaction. If hemolysis between the blood of the patient and that of the donor occurred there might be some reaction. There was no rise of temperature. As to whether the blood from the more recent cases was more efficient than that from older cases it was difficult to say, but he could say that mumps was prevented and he imagined that blood taken from a case at about the end of the disease gave the highest immunity. The blood taken from cases in which there was still some swelling seemed to work as well as that taken from others.

As to the exposure of the inoculated children, they were put in wards with children with mumps and these children were kept in bed while they had fever, but when that had subsided they were allowed to be up and about the ward and mingled with the other children. He did not see how children could be more exposed, for the other children in the wards played about the beds of those that were confined to bed.

Dr. Hess said he believed the method could be made use of in other infectious diseases as well as mumps where immunity was conferred by one attack of the disease. It would perhaps be applicable in measles, but possibly not in so great a degree. It could be used in the family where one child had measles and it was desired to protect other children. It seemed also that at some future time they might learn how to apply it in scarlet fever.

CLINICAL DISTINCTIONS BETWEEN CEREBRAL INTOXICATION, MENINGISM (SEROUS MENINGITIS) AND MENINGITIS

DR. HENRY HEIMAN read this paper. (See p. 579.)

DR. L. E. LA FÉTRA said he felt greatly indebted to Dr. Heiman for his very practical paper. Certain it was that without lumbar puncture a diagnosis could not be made in very many instances. It was perhaps advisable to resort to lumbar puncture earlier and more frequently than had been brought out in the paper. The significance of the presence or absence of cerebral tâche and of Kernig's and Brudzinski's signs in making a differential diagnosis between true meningitis and conditions simulating it might have been emphasized. If there was any doubt as to the diagnosis one should resort to lumbar puncture to see what the spinal fluid showed. In view of the fatality of true meningitis, in all doubtful cases, even if a tuberculous process was feared, it was advisable to make a lumbar puncture early, for if one finds a turbid fluid there was a good chance that it might be due to the meningococcus or the influenza bacillus, for both of which the serum treatment was available. Where the infection is due to the pneumococcus or to the streptococcus secondary to a streptococcus infection in some other part of the body, the prognosis is hopeless.

In cases of severe malnutrition meningismus may be met with, and here the marked retraction of the neck, the great irritability, and the hydrocephalus make the case appear to be one of meningitis. In these cases of malnutrition the fontanel is frequently deeply sunken, and while this is rarely true in tuberculous meningitis it is of good prognostic significance; as the child improves the fontanel fills and the retracted neck soon comes to the normal position.

A distinction must also be made in some cases of poliomyelitis with symptoms simulating meningitis, and here the spinal fluid cell count, the globulin content and the way they change offer a means of making the differential diagnosis.

Dr. Fenton B. Turck said he did not think that enough emphasis had been placed on the fact that in young animals and in children the bacteria passed readily into the walls of the intestinal tract; they passed through the submucosa, between and never through the cells, and became destroyed there or in the blood. While they did not form toxins within the lumen of the intestines when passing through the mucosa into the wall, they produced a distinct anaphylaxis. Dr. Turck said he had recently seen several cases that presented the symptoms of meningitis, and it was thought that they had the disease, but on microscopic examination and cultures, organisms were found of the B. coli group sometimes in symbiosis with cocci in the blood and the urine. In these cases it was the native bacteria, the endogenous and not the exogenous that were at fault. Three or four cases within six weeks mistakenly diagnosed as meningitis was quite a large number, and the examination showed at once that the invasion was from the intestinal lumen. The use of vaccines in these cases offered great advantages with the administration of the deficient internal secretions, elimination of the infection from the intestines, and the use of alkalies to overcome acidosis. This system of treatment, together with the withdrawal of food, or giving only arrowroot, had been very effective in such cases.

Dr. Morris Stark said it seemed to him that with these three conditions it was simply a question of degree. Dupré, who first discussed meningitis, discussed it from the standpoint that in this condition there were no lesions, but that the symptoms were the result of irritation of the meninges, and he came to the conclusion that there was some actual change in the spinal fluid, a chemical change, or a change in the leukocytes. In the very fulminating cases the reason one found no germs might be that the patient died before pus formation had had time to take place. One should also take into consideration the difference in reaction to irritation. Different groups of children reacted differently; the spasmophiliacs were sensitive to a marked degree to meningeal irritation and then there were other children who did not respond so easily. In the cases due to intoxication from the intestinal tract, the results were probably produced by bacteria in the spinal fluid, but the changes were so unimportant that they were undetected. Retraction of the neck was a very common symptom in all manner of sickness in babies, and in making a diagnosis of meningitis it became a question of the degree of retraction and the amount of force necessary to overcome it.

Dr. R. Langley Porter said that he had really nothing to add, but one point suggested itself in connection with the babies suffering from malnutrition who lie with their heads back. This condition might be due to the concentration of salts in the muscles produced by the rapid loss of fluid from the body.

The last speaker said that the conditions of cerebral intoxication, meningismus and meningitis were manifestations of symptoms different in degree but due to the same set of causes. In this connection it might be suggested that the invading organisms pass into the meningeal spaces and that breaking up there they gave rise to a definite protein intoxication.

Dr. Royal Storrs Haynes said that in connection with what had been said in regard to serous meningitis complicating indigestion, he would like to call attention to the fact that there was a type of case in which the fontanel was not retracted, as Dr. La Fétra had correctly indicated to be the rule, but, on the contrary, the exudate caused a distinct distention and the fontanel was hard and without pulsation. He had seen such a case with Dr. La Fétra in which the child had been ill with gastrointestinal intoxication and showed the symptoms of meningitis. The fontanel was full, hard, and there was no pulsation. While deciding upon the advisability of a lumbar puncture the child began to improve and pulsation returned to the fontanel. It was interesting to correlate this case with a full fontanel and symptoms indicative of meningitis with those cases in which the fontanel was sunken.

THE SURGICAL TREATMENT OF DISEASE OF THE STOMACH IN CHILDREN

Dr. Angelo L. Soresi said that the conditions for which surgery of the stomach in children were required were: wounds, foreign bodies, stenosis of the esophagus near the cardias, and stenosis of the pylorus. Surgery of the stomach in children resulted in many failures, the main reason of which was that the attending physician referred the patient to the surgeon when already in a hopeless condition. Surgery should always be a last resort, but the attending physician should keep in mind that the condition might be one requiring surgical intervention and refer the patient to the surgeon in time.

In the case of wounds the diagnosis was easy, but as it was difficult to determine the degree of injury inflicted intervention should be immediate when the child was brought to the surgeon immediately after the injury; if he was brought later expectant treatment was better because many wounds of the stomach in children healed spontaneously. Expectant treatment was imperative if the child was seen many hours after the accident and no complications were present. Dr. Soresi related the case of a child who was stabbed with a penknife by a playmate, the injury not being discovered until thirty-six hours later; no sign of distress was present; the child was never operated on, and was in perfectly good health eighteen months after. In experimental work wounds of the stomach in which the stomach was cut clean through with scissors for about the length of a centimeter, the mortality of absolute non-intervention was about 30 per cent.; the mortality of intervention after twenty-four hours was 80 per cent.; the mortality after one to three hours was zero.

Foreign bodies did not often cause serious trouble in the stomach because when they passed into the stomach they generally passed into the intestine and were expelled. However, they might locate themselves in the lower part of the esophagus and require removal through the stomach. Medical treatment was absolutely powerless if the foreign body caused serious stomach trouble, such as hemorrhage, perforation or occlusion. The difficulty in these cases lay in the fact that nobody thought of the presence of a foreign body, which could be very easily seen through the fluoroscope or with the X-ray picture.

Stenosis of the esophagus near the cardia was caused by the passage of caustics or might be congenital. In this condition, if the passage of sounds through the mouth could not be effected, the diagnosis was clear and the indications for surgical intervention were not doubtful.

Stenosis of the pylorus was a condition peculiar to very young children and, in the opinion of the speaker, was more common than was generally supposed.

Gastroenterostomy was the operation of choice up to the present time, but of course it was not a physiological operation. Dr. Soresi said he had devised an operation to conserve the physiological relations of the stomach and duodenum. A piece of ileum about 3 cm. in length was severed from the rest of the intestine. With a seroserous suture close to the attachment of the mesentery on the side that naturally came in contact with the pylorus without twisting the pedicle, it was secured over the pylorus, half on the stomach and the other half on the duodenum; it was then cut longitudinally about 2 cm. from the suture line, so that it became a large square piece, opening itself and showing the mucosa. The stomach and duodenum were also cut longitudinally, parallel with the seroserous suture line, leaving a margin of about 2 mm., as was done for the intestine. This incision was started from the duodenum and must be about 6 or 8 mm. longer than the length of the seroserous suture, extending therefore 3 or 4 mm. on the stomach and the duodenum. A through and through suture with catgut No. 0 was started alongside of the seroserous suture and continued all around, until the opening made in the stomach and the duodenum was closed. This suture done rapidly would check all the bleeding. The seroserous suture was then continued all around and the procedure was completed. It was evident that between the stomach and the duodenum there was now a large passage, lined with perfect mucosa, so that possible contractions would not affect the easy passage of the contents of the stomach into the duodenum.

Several animals which had been operated on by this method and demonstrated its advantages were exhibited. They were in perfect condition one year after the operation; in fact in much better condition than dogs operated on at the same time with gastroenterostomy, with occlusion of the pylorus or leaving the pylorus patent.

One of the essential points in surgery of the stomach in children, and for that matter in adults, was that the surgeon should never put his hands into the abdomen and should use as little retraction as possible, because the hand of the surgeon could not be sterilized, and from his research he was sure that adhesions were caused by trauma and infection. The laparotomy incision should be made about one-half a centimeter from the linea alba between the xiphoid and the umbilicus for at least 5 cm. The rectus muscle was divided by blunt dissection.

Foreign bodies were extracted through gastrotomy, and if located in the lower esophagus might give great difficulty; here a cystoscope might be very useful in illuminating the field.

In stenosis of the pylorus the surgeon had to make a good permanent passage between the stomach and the duodenum. The operation resorted to in these conditions was Loreta's, which consisted in stretching the pylorus with the finger. Gastroenterostomy by Dr. Soresi's method was preferable to Loreta's operation, to jejunostomy and to the different kinds of pyloroplasty. The gastroenterostomy should be a posterior one when possible.

Dr. Soresi condemned the use of clamps. He showed lantern slides of the technique which he recommended.

Dr. James T. Gwathney said the general principle had been accepted that chloroform was not an appropriate terminal anesthetic in children under nine years of age unless accompanied by oxygen, but one could initiate the anesthesia with chloroform and then continue with other anesthetics in such a way that the anesthetic was practically devoid of danger. The American statistics of about half a million cases showed that it was satisfactory to begin with essence of orange, then follow this with chloroform for the second stage and then change to warm ether vapor. By using this sequence the patient could be brought out of the anesthetic without struggling or vomiting, but if the anesthesia were initiated with ether there would probably be both. With gas and oxygen the anesthesia could be continued with children of any age. The element of time must be taken into consideration, especially with children, and while the surgeon must do his work carefully and without hurry, he should not lose sight of the fact that the child should not be kept under the anesthetic longer than necessary. As a rough general rule it might be stated that children should not be kept under an anesthetic longer than one hour.

DR. LEON T. LE WALD said he agreed with reference to the question of diagnosis that repeated examinations with the Roentgen ray offered the safest and surest way of determining between spasm and true stenosis of the pylorus. There were several ways of making this distinction, but in his opinion, if nothing was passing through the pylorus in from one to three hours after the administration of the bismuth meal this was an absolute indication for surgical interference. Dr. Le Wald said he had seen gastroenterostomies that were successful in children and the children were well nourished afterwards. In 1 case which he had followed for two years the function was perfect and the child was well nourished.

DR. WILLIAM H. STEWART said that in reference to Dr. Soresi's remarks on foreign bodies it was well known that many foreign bodies passed safely through the digestive tract; even open safety-pins had been known to pass through without giving any trouble. The only indications for interference were when the body swallowed occasioned clinical symptoms. In regard to the differential diagnosis between pylorospasm and true stenosis, the X-ray was undoubtedly a great help, but he questioned whether if no bismuth was found passing through the pylorus after three hours that was sufficient evidence that one was dealing with a true stenosis. Such an X-ray finding would at least have to be verified by a number of examinations. In some cases in which nothing passed the pylorus for three and one-half hours after the administration of the bismuth, a re-examination showed the bismuth passing through the pylorus. It was of particular interest that an organic stenosis might result from pylorospasm. The small but constant irritation of the spasm over a considerable period of time produced a hypertrophy of the muscular structure, and eventually stenosis.

Dr. Stewart asked Dr. Soresi if he had made any observations on the stomach of dogs after gastroenterostomy with reference to the emptying of the stomach. In what proportion did the bismuth meal pass through the patent pylorus and in what proportion through the gastroenterostomy opening? It had been asserted that 95 per cent. of the food ingested passed through the pylorus, while only 5 per cent. passed through the gastroenterostomy opening. This had not been his experience; he thought that about 50 per cent. passed through the pylorus and about the same amount through the stomach. It had been interesting to hear what the speaker had said in reference to the susceptibility of bone to infection. Some men were saying now that the death knell of Lane's poates had been sounded. He had watched Dr. Lane do his operation and the vital point in his technique was that at no time did the operator's hands come into contact with the bone.

Dr. Fenton B. Turck said that Cailli had reported (Rivista Ospedaliera) the case of a child having spasm of the intestine with obstipation which had persisted for three weeks. There was continual vomiting and all the symptoms of intestinal obstruction. An exploratory operation showed that the condition was purely spasmodic, so the wound was closed and a systematic course of treatment carried out, under which the child recovered. Some had ventured to state that a purely spasmodic condition would not last as long as three weeks, but the speaker had observed the condition to persist for a long time in spasmophilic children, and it represented a type of fatigue, a delayed period of relaxation following contraction, which continued for a long time and was often mistaken for true stenosis. It was possible for bacteria to pass from the mother to the fetus and to lodge in the muscle fibers in the pylorus and there to set up irritation which might result in a congenital mechanical obstruction, due to hypertrophy of the muscles and stenosing pylorus. One should be very careful in making a diagnosis of real obstruction, which rarely existed. Treatment directed to recovery from the fatigue of the muscle wall of the stomach and intestines have the best results.

Dr. Soresi, in closing the discussion, said that in his paper he had insisted on repeated X-ray examinations, and stated again that in order to be certain that one was dealing with a real stenosis of the pylorus and not with a spasm, the X-ray examination should be repeated several times, and that surgical intervention should not be resorted to until all medical means had been exhausted. With reference to the emptying of the stomach after gastroenterostomy in animals if the pylorus was patent, it could be seen with the X-ray that a great amount passed through the gastroenterostomy opening which might be due to the fact that in the passage of food from the stomach through the pylorus it has also to pass in descending to the intestine over the gastroenterostomy opening. In animals it was seen that if the pylorus was patent the dog was in perfect shape, ate, and acted normally, but if the pylorus was excluded the dog got thinner, no matter what kind of food or how much was given to make it fat. This might be explained by the fact that the digestion in the stomach of the dog was exceedingly slow, and when the pylorus was excluded and the gastroenterostomy opening was made the food passed very rapidly and digestion was not complete. In human beings this did not occur because the digestion of food in the stomach was not so slow as in animals; that was not if the food or a part of it remained in the stomach a certain time after, even if it had to pass through the gastroenterostomy opening. Dr. Soresi again insisted on the avoidance of trauma through the bad practice of introducing the hands into the abdomen. He exhibited a number of specimens showing the results obtained by the reconstruction of the pylorus, and the effect of the presence of unabsorbable material in the stomach and intestine, demonstrating that when such material was present the scar tissue became much thicker.

Voice Sign in Chorea—Continuing his study of the voice changes in chorea, W. B. Swift (American Journal Diseases of Children, 1914, Vol. VIII., p. 279) finds in 20 cases of chorea, with over 500 observations on the voice, a change of pitch and intensity in 2 cases out of 3. These choreic voice changes are more frequent in the vowels, less so in whisper, whistle, consonants, air blow and holding of breath; and are less and less in frequence in this order. Other less frequent and less marked changes occur that seem of interest subordinate to those in the vowels. The most marked change occurred in the open prolonged sound of "a" as in "are," and therefore this is offered as the routine clinical test and method for the elicitation of the choreic voice sign.—*The American Journal of Obstetrics.*

THE PHILADELPHIA PEDIATRIC SOCIETY

March 9, 1915

WM. N. BRADLEY, M.D., PRESIDENT

DR. RALPH BUTLER removed the tonsils of a child by the Sluder method. In demonstrating this operation Dr. Butler said: "The Sluder operation for removing the tonsils is done with one instrument. Sluder modified the Physick tonsillotome by stiffening the shaft and dulling the blade. This instrument which I am about to use has been further modified by Sauer, who added a screw arrangement by which the blade can be forced home easily and slowly.

"In brief, the technic consists in placing the aperture in the blade over the tonsil, scooping it out of its bed and pulling it forward and upward until it lies over the alveolar eminence which is used to crowd it through the aperture. The tonsil is then slowly squeezed from its attachments and is completely removed with its capsule.

"In the hands of the operator less time and ether are required and there has been less secondary hemorrhage than with other operations."

DR. CHARLES V. DORWARTH, in showing a case of disturbance of pituitary function, said: "The following case is regarded as a mixed type of disturbance of the pituitary function, because it shows evidence of a perversion of the anterior lobe of the pituitary body, as demonstrated by skeletal overgrowth, and insufficiency of the posterior lobe as demonstrated by excessive adiposity.

"*History*—E. S., age four years and seven months. Admitted September 24, 1914.

"*Family History*—Paternal side negative. Maternal side shows a tendency to obesity.

"*Birth*—Normal. Weight at birth not determined. At nine months weighed 36 pounds; at one years, 44 pounds.

"*Present Condition*—Rapid gain in weight since birth. Has never had convulsions; no injuries; sleeps well; no enuresis; becomes friendly on persuasion; does not masturbate or menstruate; is not difficult to control; plays about as other children; answers questions intelligently; no special liking for sweets; no disorder of vision; no headache. Height, 42½ inches; weight, 97 pounds. In three months gained 1¼ inches. In five months, gained 2 pounds, 12 ounces. Blood, hemoglobin, 50 per cent.; otherwise negative. Urine, no polyuria. Specific gravity normal. Hypophyseal symptoms negative. Skiagraph negative. Glandular symptoms, skeletal overgrowth; separation of the teeth; skin moist and smooth. No hair in axilla or over pubes. Adiposity extreme and equally distributed over body. Flesh not tender. No pigmentation of skin. Temperature never subnormal. Pulse between 100 and 110. Blood pressure, 85. Other ductless glands negative. According to Cushing's classification this case would be regarded in Group 3."

In demonstrating the method of making vaginal washings for bacteriological diagnosis, Dr. Dorwarth said: "Several years ago we took only vaginal smears in cases that were brought to the dispensary for vaginal discharge. These often failed to show the presence of gonococci, although the patient exhibited clinical signs of vaginitis. We then took smears and vaginal washings in such cases and generally gonococci would be found in the washing but absent in the smear.

"In making vaginal washings, the following materials are necessary: Cups, liquid soap, sterile water, mercury chloride dissolved in normal salt solution, so that strength represents a 1-4,000 mercuric chloride solution; sterile cotton sponges, vulvar pad, sterile test tubes, pus basin, rubber draw sheet, etc.

"Operator should wear a clean gown and rubber gloves. Materials used should be utilized for vaginal washing alone.

"Child is placed upon her back, with the thighs abducted on an examining table; rubber draw sheet being placed under the buttocks.

"The vulva is cleansed with soap and water. A pipette containing the bichloride solution is introduced into the posterior vagina, and by alternately emptying and filling the pipette the adherent secretion and superficial cells are detached and mixed with the solution. The solution is then placed in a test tube.

The procedure is repeated until enough secretion is obtained for examination. The vulva is cleansed with soap and water after the washing and vulva pad applied. The vaginal washing is sent to the laboratory for examination."

Dr. Kolmer, in discussing Dr. Dorwarth's demonstration, emphasized two points: (1) The necessity of using normal salt solution for making the vaginal washings, as the use of distilled water gives very imperfect preparations and greatly increases the difficulty of making bacteriological examinations. Bichloride of mercury may be added unless it is desired to make cultures of the washings, in which case it must be omitted. (2) It is advisable to centrifuge the vaginal washings as soon after collection as possible, so that smears may be prepared before changes occur in the cells.

Dr. G. M. Coates, in reporting a case of circumscribed labyrinthitis, said: "The patient was a boy of thirteen, first seen February 9, 1915, with discharge from both ears for seven years without intermission. Large tonsil and adenoid hyperplasias; origin of otitis probably coryza; no history of exanthemata. A. D. shows total destruction of membrana vibrans and part of ossicles; discharge, foul and scant. A. S. small perforation in anterior part of Schrapnell's membrane; foul scanty discharge.

"*Present History*—For eight weeks past has had a number of severe attacks of vertigo, each lasting from two to three hours, eyes not observed by family physician, no pain or headache, perfectly well between attacks.

"*Examination*—Hearing for watch, 10/50 both ears; whisper, 10 feet and good for conversational voice. Lower tone limit raised, upper not lowered. Weber test not lateralized, Rinne markedly negative in both ears, Schwabach not prolonged. No spontaneous nystagmus with eyes at rest, but suggestion toward the right with eyes in that direction and on turning the head suddenly. Caloric test; strong reaction obtained in A. D. in forty-five seconds, marked vertigo, easily neutralized and reversed. A. S. same reaction in ten seconds, marked. Rotation test gave the usual after-turning nystagmus of twenty seconds for each side. Fistula test was negative, as far as could be determined.

"To make a complete diagnosis the fistula test is needed, but here must be made by exclusion. The chronic suppurative otitis media history of vertiginous attacks, the normal or even hypersensitive condition of the semicircular canals, and the well-preserved cochlear function make the diagnosis, even in the probable absence of the fistula test. Secondly diffuse serous labyrinthitis is excluded by the amount of function preserved in this case. This form also should show the fistula symptom. In diffuse purulent labyrinthitis we have no fistula symptom, but then there is invariably also total loss of both vestibular and cochlear functions. In secondary serous induced labyrinthitis we have the same picture as the last, except that there is a remnant of function remaining.

The symptoms of circumscribed labyrinthitis are tinnitus, vertigo at intervals, emesis during attacks, disturbances of equilibrium at times, nystagmus (spontaneous), and, of course, the symptoms due to the suppurative middle ear condition, usually chronic, that precede and accompany the labyrinthitis.

"Closer observation of these patients is urged during attacks when they are generally seen by the pediatrist. The direction and duration of the nystagmus is of particular value."

Dr. John H. Jopson showed 2 cases illustrating the results of Bevan's operation for undescended testicle. One was a boy aged seven years who had been operated upon three years before. He exhibited at that time double undescended testicle with hernia on the right side. On the left side, the testicle could be palpated in the canal near the external ring. The right side only was operated upon and the result of the operation was ideal. The left testicle had not come down, as it was hoped that it would without operation and another operation would be required to bring it down.

The second case was a boy of ten, operated on one year before for undescended testicle on the right side, the left being normal. There had been some pain and swelling of the organ following unusual exertion a few days before the operation, probably due to torsion or traumatism. No hernia was present in this case. In this patient also the Bevan technique gave a perfect result.

Dr. Jopson reviewed the indications for operation in this condition and stated that he had performed the operation in about 12 cases and in only 2 was it impossible to bring the testicle down into the scrotum. In these 2 the organs had been removed; one case in a very young child, where it was very poorly developed, the other patient being an adult with a large hernia and an undeveloped organ. The operation was strongly indicated in practically all cases of non-descent in childhood and should be done before the age of puberty. It is not advisable, as a rule, to operate before the patient is three years of age, except in the presence of a strangulated or large, bothersome hernia. It is inadvisable to attempt to do too much in a young patient and it may be necessary, therefore, to avoid operating on two sides at the same sitting where the condition is a double one. Dr. Jopson believed it advisable to avoid division of the spermatic vessels where possible, as limitation of the blood supply of the organ did not seem to him a good thing when we wish to do everything we can to encourage its future development. He believed that only exceptionally would such division of the vessels be required to bring the testicle into the scrotum. He mentioned the fact that in not more than 60 or 70 per cent. of his cases had hernia been associated and he also mentioned certain observations which had suggested to him that the condition might, in some instances, be due to attachment of the muscular fiber of the gubernaculum testis to the vas, in place of their normal attachment to the testicle. He had observed that in some instances the cord was drawn down in a loop nearly to the normal position of the testicle, while that organ was left behind in the inguinal canal at a much higher level.

DR. GEORGE P. MÜLLER showed the following cases:—

CASE 1. Renal sarcoma. A. D., age seven; father has nephritis; about one year ago child began to lose weight, and the abdomen, especially in its upper part, to become prominent. He seemed to keep up in strength but frequently complained of sleepiness and headache. There was no nausea, vomiting, or epigastric pain, and the bowels continued to move regularly without laxatives, nor was there blood in the stools. He has never been jaundiced. His mother thought he had fever at night. Examination revealed impaired resonance in the right lung base due to upward pressure on the diaphragm, but no râles. The abdomen is prominent, veins very prominent, and there is bulging anteriorly, posteriorly, and laterally in the right loin. A firm, slightly nodular mass can be felt, moving on deep inspiration, and distinctly renal. The mass extends downward to below the line of the umbilicus; most of the lymph nodes in the body are slightly enlarged, but no other symptoms were noted.

Operation October 28, 1914. Ether anesthesia with novocaine infiltration anesthesia. An oblique incision was made in the costovertebral angle to the border of the right rectus muscle. The kidney mass, as large as a child's head, was delivered and the pedicle ligated. The adhesion to the diaphragm was fairly close and in the separation the pleural cavity was opened, but immediately closed by linen suture. At another point the thin capsule tore and some tumor tissue was spilled into the wound. It was mopped out immediately and the wound thoroughly irrigated with salt solution. The peritoneal cavity was not opened at any time. A drain was introduced and the wound closed. Some trouble was experienced with wound healing, but by December 1st everything was healed tightly. The Wassermann reaction was negative in this case; leukocytes were 8,800, with a polynuclear count of 61. Hemoglobin was 57 per cent. and the red cells 3,720,000. Microscopic examination by Dr. Kolmer revealed an adenosarcoma of the kidney.

Remarks—This case is typical of the so-called adenosarcoma n children. They probably develop from the intermediary cell nass in the embryonic kidney. At the time this case was reported the child was in excellent health, but since then (April 15, 1915) symptoms suggestive of a possible recurrence have been noticed. There has been loss of strength, slight fever, and a development of large mesenteric nodes. There are no symptoms suggesting metastases to the lung.

Case 2. Fracture of the femur. T. R., age fourteen. On October 21, 1914, fell off wagon and was run over. Sustained a fracture of the right olecranon and a severe lacerated wound of the soft parts of the arm and a fracture of the lower third of the left femur. The arm wound was irrigated with tincture of iodin, sutured, and dressed, and an attempt made at reduction of the femur; Buck's extension with weights and an external splint applied, and the weights rapidly increased up to 30 pounds. An X-ray showed the fracture in rather poor position. The arm wound remained clean until October 28th, when it began to discharge foul-smelling pus. A week later the wound was clean again and it was then thought safe to operate on the femur.

Operation November 6, 1914. Ether anesthesia. The fragments were found, brought into apposition, and held by a plate and screws. Long external and internal splints were applied with Buck's extension and 5 pounds of weight. The arm healed rapidly and the operative wound healed by first intention. On December 11, 1914, the X-ray showed the fracture in good position. Massage was started on December 19th, and the patient discharged on crutches with instructions to return for massage and inspection. On March 9th, 1915, he walks without a limp and there is a moderate amount of callous at the site of the fracture. There is no shortening.

Remarks—It is generally admitted that in children fractures of the extremities do well, the percentage of successful results being quite high. In the occasional case it is impossible to bring the ends into apposition and there is bound to be a certain amount of shortening and deformity. In these cases operative treatment, if done under proper technic, gives uniformly successful results. I have operated on twelve simple fractures in children under fifteen years of age and have plated one compound fracture in a child. With the exception of 1 case every one of these healed by first intention and remained clean. In the one exception the child developed scarlet fever three days after operation and was removed to the Municipal Hospital. She returned two months later with a small abscess over the plate. Through an incision the pus was evacuated and the plate removed and the wound promptly healed. In one other case complete failure attended the operation. The patient, a child of two years, fractured the tibia in September, 1910. She was treated by fixation during the fall of that year. In January, 1911, there was still non-union and I cut down and fastened the ends of the bone with a catgut suture. Non-union persisted, and on July 20th, 1911, a small plate was introduced. Non-union still persisted, and on March 25, 1912, Dr. G. G. Davis removed the plate and inserted a bone transplant. In spite of this operation there was absolute non-union on January 28, 1914. Many X-rays showed the entire absence of callus at any time. Plating was not indicated, but was done in the hope that the irritation of the screws might stimulate callus formation. In every other case a perfect result was obtained, without shortening and without deformity.

Case 3. Pneumococcic meningitis. J. K., age four. On August 10, 1913, sustained a compound, comminuted fracture of the skull in the right temporal region. The brain was exposed. The dura was partly closed and the fascia and skin were sutured. On August 28th the child was discharged apparently cured. About ten days later she had a "rash," lasting a few days and a few days later she began to complain of headache. On October 14, 1913, she was seen in the dispensary and found to have fever and a tense hernia cerebri. The mother refused to bring her into the ward at this time. The headache was always worse at night; appetite was variable. Was readmitted to the Polyclinic Hospital November 4, 1913. There was headache, local tenderness and the hernia. Temperature, 104°; pulse, 158; respiration, 20. The neck was rigid and tender; Kernig's sign was present; the diagnosis of meningitis was made. The eye-ground examination revealed considerable swelling of the nerve heads. After a few days the child seemed to improve, simple stimulant and eliminative treatment being given, but later she relapsed. On November 21, 1913, 10 c.c. of spinal fluid was withdrawn and the following injected: 0.5 c.c of 1 per cent. sodium oleate; 1.0 c.c. of antipneumococcic serum; 3.5 c.c. of boric acid solution (5 per cent.).

November 22, 1913: The above was repeated.

November 23, 1913: "The child appears to have less pain in the head, back and limbs, cries less and has a better appetite. There is distinctly less rigidity; Kernig's sign is barely present."

November 23, 1913: The injection was repeated.

November 26, 1913: The fifth injection was given. The fluid spurted out, and 20 c.c. was withdrawn.

November 26, 1913: The child had a number of convulsions during the night.

December 1, 1913: Lumbar puncture. Fluid clear.

December 11, 1913: Convulsions. Weaker.

December 14, 1913: Death. No autopsy.

Blood Count	11.6	11.7	11.10	11.12	11.24
Leukocytes	28,400	22,200	22,600	22,600	19,500
Polynuclears	83	—	76.5	—	83.5
T	1.5	—	2.0	—	1.5
Lymphocytes	9.0	—	17.5	—	11.5
Large Mononuclears	16.5	—	3.0	—	2.5
Eosinophiles	0.	—	1.0	—	1.0
Hemoglobin	94.	—	—	—	82.
Reds	4,690,000				3,930,000

SPINAL FLUID

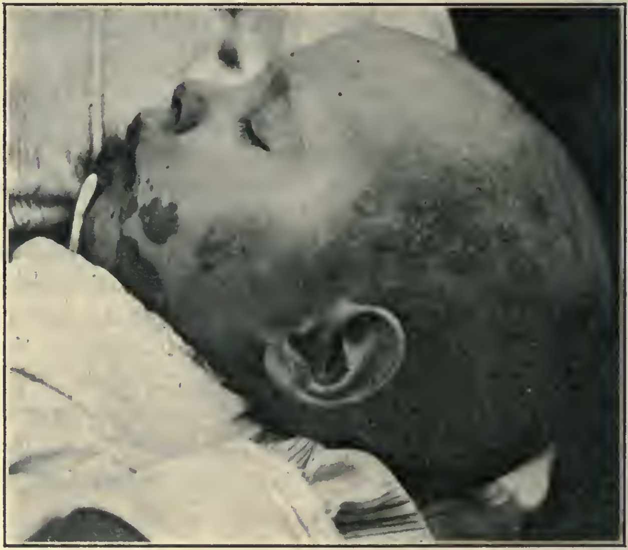
Index		18%	2%	Few or-	No or-	No or-	Few or-
	11.14	11.21	11.22	11.23	11.24	11.26	12.1
Amount	10 c.c.	10 c.c.	10 c.c.	10 c.c.	10 c.c	20 c.c.	10 c.c.
Cells. Total Count	17,360	21,700	13,500	13,000	7,400	7,200	5,800
Polynuclears	90	96	93	97	95	90	94
Lymphocytes	1	0	4	1	5	5	5
Mononuclears	9	4	3	2	0	5	1
Index		18%	2%	Few organisms	No organisms	No organisms	Few organisms

Remarks—I did not know of the work of Lamar until some days after the admission of the patient. It will be remembered that he investigated the influence of soaps upon pneumococci. It had been found by others that substances derived from tissue cells and leukocytes were bacteriocidal and these substances were found to be largely in the nature of highly saturated fatty acids or their alkaline soaps. This action is somewhat inhibited by the protein constituents of serum and exudates and to prevent this inhibition boric acid is added. Lamar's investigations have been published in the Journal of Experimental Medicine. The later symptoms in this case showed that the ventricles were probably full of pus. In view of the results of treatment of the spinal canal I would urge that similar injections be practised upon the ventricles in cases of pneumococcic meningitis.

DR. JAY FRANK SCHAMBERG reported the following case of extensive fatal thrush, with involvement of the skin and secondary infection of the mother's breasts:—

E. C., an infant of six months, had been nourished since birth on breast milk. At the age of seven weeks she first developed whitish patches in the mouth. The child was treated by numerous mouth washes containing borax, potassium permanganate and the mucous membranes painted with silver nitrate, but all without benefit. At the time of my first examination the entire mouth was the seat of milk-white "curdy" looking patches, which covered the tongue, cheeks, roof of mouth and pharynx. The child had been voiceless for several months. The patient was pale and undernourished. The notes made at this time read as follows:—

Face—The left side of the face below the level of the mouth exhibits three sharply-marginated, reddish patches with scaly borders; the largest patch is about 1½ by 1 inch in diameter, the smaller ones a third of this size. There are also scattered on both sides of the face and on the chin pin-head to pea-sized, reddish, scaly patches.



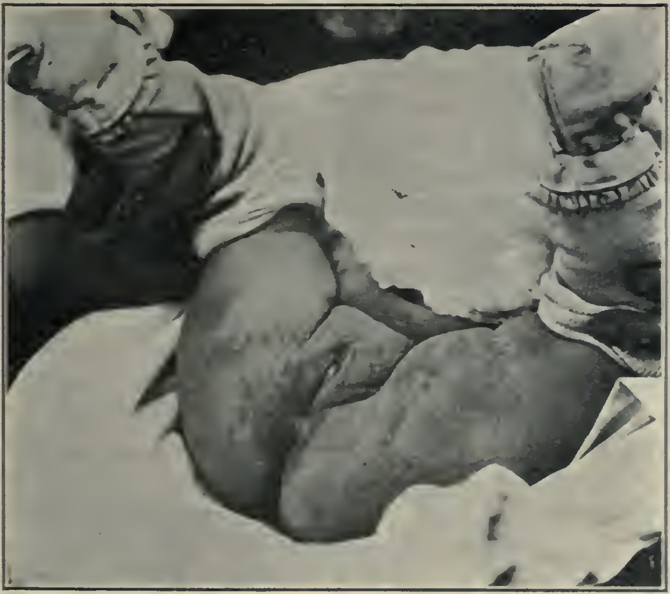
Showing eruption on face of Dr. Schamberg's case of sprue

Scalp—On the left lateral surface of the scalp are about a dozen scaly patches a centimeter or thereabouts in diameter, with drab-colored scales and with some tendency to be circinate. These patches strongly resemble ringworm of the skin.

An extensive eruption is seen on the vulva, mons veneris, thighs, perineum and buttocks. This entire area is the seat of a sharply-marginated, reddish, scaly eruption looking not unlike the "eczema marginatum" of the older writers. There are sharply-contoured outlying patches which accentuate the resemblance to ringworm. Duration of the eruption in this region two months.

Mother's Nipples—Extending about the nipples is a circular, slightly reddened, scaly eruption having a radius of about one inch. The condition presents the appearance of a mild eczema of the nipples. The mother states that her nipples are much less inflamed now than they were.

Microscopic Examination—Scales scraped from the mouth, cheeks, scalp, genital region and from the mother's nipples all showed an enormous abundance of mycelium and spores. Microscopically and in culture this fungus was demonstrated to be the saccharomyces albicans. Cultures of this fungus were also obtained from the baby's stools. The baby did not suffer from diarrhea. She was under-nourished and pale; latterly she has not been nursing well.



Showing eruption on buttocks of Dr. Schamberg's case of sprue

All local agents having failed it was decided to make a vaccine of the saccharomyces and endeavor to improve the child's resisting power against this parasite. The treatment was, however, without avail, and the child became progressively weaker and ultimately succumbed.

Thrush involving the skin must be uncommon in view of the paucity of literature on the subject. Excoriations of the skin in the neighborhood of the mouth may readily become infected with the thrush fungus. A casual survey of the literature, however, has not discovered the publication of any observations on the occurrence of cutaneous thrush affecting distant regions or of the transference of infection to the mother's breast.

Dr. John A. Kolmer demonstrated the method of injecting the toxin for the Schick test. He laid especial emphasis on the necessity of using a ripened toxin that has been properly titrated for its minimal lethal dose and the use of an accurately adjusted syringe and a fine needle. The injection must be made in the layers of the epidermis and must leave a white anemic spot indicating that the injection has been properly made. He uses 1/40 of the minimal lethal dose of toxin for a 250 gram guinea pig, so diluted with sterile normal salt solution that this amount is contained in 0.05 c.c. of fluid. By injecting this small amount trauma is reduced to the minimum. The reactions are usually present within forty-eight hours after injection. An area of erythema measuring more than 5 mm. in diameter is regarded as a positive reaction. This test gives considerable promise of possessing practical value in determining which persons require passive immunization with antitoxin when exposed to diphtheria

Dr. John A. Kolmer and Dr. Albert Strickler showed a patient with ringworm of the scalp in which an intradermal injection of the extract of the microsporon audouini was followed in twenty-four hours by an area of erythema and slight edema. They have found similar reactions in a number of cases of ringworm of the scalp. In persons free of this disease the reaction is negative or traumatic in character. They also demonstrated a reaction in the same patient following the intradermal injection of an extract of achorion schönleini, the fungus of favus; a reaction likewise followed which was of less degree. These anaphylactic reactions tend to show the biological relationship of the fungi of these two diseases, which the authors also found in the complement fixation reactions.

Dr. John A. Kolmer and Dr. S. McC. Hamill also showed an anaphylactic reaction in a child suffering with asthma, following the intradermal injection of a minute amount of egg albumin. In about thirty-six hours after injection a large area of erythema developed. Since the withdrawal of eggs from the diet of this child there have been no attacks of asthma.

Dr. Matthew S. Ersner gave his experiences with vaccine treatment of otitis media, saying: "The class of patients that I speak about are all chronic suppurative otitis media, extending from a period not less than six months up to twenty-five years.

"These patients were all treated in the dispensary by various methods at our command, and if we convinced ourselves of their chronicity we prepared vaccines for them.

"Vaccines should not be condemned unless given a thorough trial; since we have no method at present to determine the causative bacteria, we are apt to discard various bacteria from the vaccine, thinking them to be saprophytes.

"At the time of reading, we had 39 cases treated with vaccine; 17 of them are children, and I speak only of the children.

"Few patients responded to the first vaccine, but for most patients I had to prepare three or four vaccines until ears became dry, and have some patients still discharging, for whom I already prepared five vaccines. This corroborates the above statement on how careful one must be before condemning vaccines.

"The most prevalent bacteria found in discharging ears are Staphylococcus, pyocyaneus, pseudo-diphtheria and streptococcus.

"The reactions to vaccines when administered are: (1) Local *a*—At site of injection; *b*—Reaction in ear. (2) General

"No. 1. *a*—At site of injection there is slight swelling, areola, and increase of heat. *b*—Discharge first increases, pus becomes thin, and, after several injections, pus diminishes, becomes thicker, until dry ear is attained.

"No. 2. General reaction: Elevation of temperature, chill (only 1 case).

"The dose of vaccine varies. In children the doses are smaller, and, until we get a local reaction, we again work in the dark.

"For arbitrary purposes the doses are as follows: Streptococcus, 25,000,000 to 50,000,000; staphylococcus, 250,000,000; pyocyaneus, 500,000,000; pseudo-diphtheria, 250,000,000.

"In administering vaccine never give injection at same area, for if there is a local reaction there must be a local chemataxis, stimulation, and accumulation of antibodies, and by repeatedly injecting in same area that area may be destroyed and thus spoil results we are seeking.

"Failures in vaccine treatment may be due to the following causes: (1) Poorly prepared vaccine. (2) Failure to obtain causative bacteria. (3) Administration of too small a dose. (4) Overdose, thus producing a negative phase. (5) Lowered vitality of patient. (6) Irregularity in attendance. (7) New infections.

"*Summary*—Pyocyaneus—8 cases; 5 dry, 3 wet. Staphylococcus—7 cases; 4 dry, 3 wet. Streptococcus—1 case; dry. Pyocyaneus and pseudo-diphtheria—1 case; dry.

"Four cases returned, discharging again. Old vaccine tried, but did not respond. Cultured, and found 2 cases previously staphylococcus, now pyocyaneus. One case previously staphylococcus, after being dry for two weeks, caught cold, developed mastoid, cultured and found streptococci. Mastoid performed, streptococcic vaccine administered, ear dry at present. One case previously pyocyaneus, again cultured pyocyaneus, and patient is still under our care. All these patients who returned gave history of catching cold in the head, and ears began to discharge again."

Dr. A. Strickler talked on the vaccine treatment of ringworm of the scalp. "The vaccine treatment of ringworm of the scalp finds its scientific justification in the complement fixation test. Although the infection is superficial, not reaching the cutis vera, still sufficient reaction occurs to cause positive complement fixation, using the ringworm fungus as an antigen. In our series 78 per cent. positive reaction were obtained. The vaccine was prepared by growing infected hair previously soaked in absolute alcohol for twenty minutes, then washed with sterile water on 'French-proof agar.' After growing for twenty-four days at room temperature, the growth was removed into a sterile mortar and ground up thoroughly with sufficient sodium chlorid crystals and finally sterile water added to bring it up to normal salt solution. Usually about 500 c.c. was made from each growth. Ten c.c. of chloroform was then added and the vaccine heated for about one hour at 60°C. The vaccine was then tested, both for live fungi and also ordinary bacteria.

"The treatment consisted of injecting 1 to 2 c.c. of the vaccine every four days between the scapulæ. Ofter after six injections the area became red and irritated; then painting the area with iodin and the use of an ichthyol dressing effected the subsidence of the symptoms.

"Up to date 7 patients have been cured. No case was discharged as cured unless microscopic examination of the hair in and around the infected area showed the absence of fungus.

"In conclusion, we can state that it is possible to cure ringworm of the scalp by vaccines. How great the percentage of cures which can be obtained by this method of treatment alone time and a greater experience alone can tell. It seems highly probable that vaccine with local treatment will equal in its rapidity and efficiency the X-ray method of treatment, without sharing in the dangers of the latter method."

Dr. S. McC. Hamill presented a series of charts summarizing the results of a survey of the Children's Dispensary in the Polyclinic Hospital.

Dr. C. R. Reiners, in giving a summary of the Wassermann reactions made in the routine examination of 179 children, said: "While outlining a review of the work done in the children's ward in this hospital, Dr. Hamill requested me to review and summarize the laboratory records regarding the Wassermann reactions.

"This paper is merely a review of the laboratory records of cases examined routinely in the children's ward, which records bear the clinical diagnosis with only occasional reference to the clinical history. The only instances in which the ward records were referred to were three. The first of these was a 'wetnurse,' who, owing to the illness of the mother, had been nursing a syphilitic baby for a period of four weeks. As soon as it was learned that the Wassermann reactions done on the mother and baby were positive, the nursing was discontinued, the breasts were examined for suspicious lesions and a Wassermann performed. No lesions were found and the Wassermann was negative. The second case was a child brought to the dispensary with a dactylitis. A Wassermann reaction was strongly positive, while a Wassermann done on the mother proved moderately positive. The third instance was in the case of an Italian mother and child. The child was suffering from malnutrition. The mother's blood gave a weakly positive reaction and the infant's was negative.

"The results in general as shown by the records are as follows: Of 179 cases examined, 23 were positive and 156 negative.

"The classification of the positive results according to age is as follows: Of 23 positive cases 9 were one year or under; 3 were between one and two years; 5 were between two and five years; 4 were between five and twelve years.

"The classification according to the diagnosis: Of 23 positive cases, 8 had been diagnosed clinically, and in 15 syphilis had not been suspected. Of these 15 latter cases the diagnoses were Bronchopneumonia, 1; backward child, 1; enuresis, 1; digestive disturbances, 2; mitral endocarditis, 1; monstrosity, 1; enlarged tonsils, 2; persistent thymus, 1; acute rheumatic fever, 1; and 4 cases where no clinical diagnosis was made at the time of the request.

"In classifying the negative and positive results in relation to the different organic systems involved at the time of the examination we find the following:—

Gastrointestinal	2 +	61 —
Hepatic	0 +	2 —
Respiratory system	1 +	25 —
Mental and nervous	4 +	8 —
Genito-urinary	1 +	4 —
Congenital deformities	1 +	3 —
Lymphatic structures	2 +	5 —
Miscellaneous	2 +	11 —

"In addition to these is a group of 23 cases in which no diagnosis was made at the time of the request for a Wassermann, of these 2 + and 21 —.

"Inasmuch as the number of cases coincide so closely with the number reported by Holt in 1913, the following comparison has been made: Of his 178 tested, 167 negative and 11 positive, as against our 156 negative and 23 positive in our group.

"In a group of 56 cases of congenitally deformed infants reported by Holt in 1913, not a single Wassermann was positive, while in our much smaller group of 4 cases we found 1 positive and 3 negative. Holt in the same paper reported 62 cases of marasmus and malnutrition in which 5 were positive and 57 negative, while in our group of 30 cases 2 were positive and 28 negative. The higher percentage of positive Wassermanns in our group would suggest that the relatively higher percentage of colored children treated in this hospital might account for the difference. The relative percentage of white and colored children treated will be referred to later by Dr. Hamill. Another point of interest is that Holt's series dealt entirely with infants, while ours included children up to twelve years.

"Inasmuch as the percentage of positive results among infants examined by us was so much higher than other age periods, one would have expected the positive results in Holt's group to be larger than ours."

Dr. John A. Kolmer, in discussion, drew attention to the fact that cholesterinized extracts were of great value as antigens in conducting the Wassermann reaction, especially in congenital syphilis. When these extracts are used in a proper manner they constitute the most sensitive with which Dr. Kolmer is acquainted. He also called attention to the fact that the Wassermann reaction has shown that Colles' and Profeta's laws are probably incorrect, for the apparently healthy mother of a syphilitic child has frequently a latent syphilis, and, on the other hand, an apparently healthy child of a syphilitic mother is really suffering with a latent form of congenital syphilis.

Tuesday, April 13, 1915

Wm. N. Bradley, M.D., President

The stated meeting of the Philadelphia Pediatric Society was held in the College of Physicians, Tuesday, April 13, 1915, with the President, Dr. Bradley, in the chair.

Dr. Alice Weld Tallant reported a case of hemorrhagic disease of the newborn, and said: "Philip K. was born at the Maternity of the Woman's Medical College of Pennsylvania, February 8, 1915. The family history was good, and the birth normal, and the baby weighed 8¾ pounds. On the morning of the third day of his life an area of hemorrhage developed under the skin of the neck and upper chest, extending up under the left ear, and by night it had risen almost to the chin and under the right ear. A small hemorrhagic spot was found on the roof of the mouth, and a bowel movement showed streaks of fresh blood. The temperature, pulse and respiration rose rapidly to 103.4°, 168 and 52 respectively. By the next morning the hemorrhagic area was so swollen that the child lay with the head far extended, and was cyanosed and dyspneic from the pressure, nursing was impossible; the muscles of the legs and arms were rigid. Three petechial spots appeared on the back and one on the ankle, and there was slight oozing from the cord.

"The child had been for twenty-four hours on gelatin and adrenalin, with whiskey as stimulation. He now received in addition 2/3 ampoule of P. D. & Co. coagulose hypodermically that afternoon, and the rest of the ampoule the next morning. No further change in the child's condition was noted for twenty-four hours, except a slightly lower range of temperature, pulse and respiration. From that time on the symptoms gradually abated, the swelling slowly softened, and by the sixth day of the disease nursing was resumed. The cord separated without bleeding on the fifth day after the onset of the disease, the navel never showing signs of infection. One more petechial spot was found on the chest. The child's weight had dropped to 7 pounds, 7½ ounces during its illness, but 3 ounces were gained in the next three days. Then the mother insisted on going home. When the baby was about seven weeks old he was brought back to the hospital for examination. There was no trace of the hemorrhagic area remaining, the baby seemed perfectly well, and weighed nearly 13 pounds.

"The interesting points in this case are: (1) The fact that the principal hemorrhage was beneath the skin, not in the mucous membranes. (2) The location of the hemorrhagic area, causing symptoms of cyanosis and dyspnea. (3) The use of coagulose, on the principle of the use of blood serum. (4) The rapid gain after the disease was controlled."

Dr. William Drayton, Jr., exhibited 2 cases of pellagra in children that had always lived in Philadelphia. Both patients were girls about eleven years old. The one was of Italian, the other American, parentage, and neither had ever been out of the city for more than a day or two at a time. Both came under observation on account of difficulty in locomotion, the gait being ataxic with a suggestion of spasticity. Both presented a roughness of the dorsum of the hands and similar cutaneous changes about the eyes. In both cases symptoms of the disorder had been present for five or six years. In one the cutaneous lesion had been noticed at the outset on the hands, while in the other there had been attacks of diarrhea. In both the reflexes were increased and slight nystagmic movements of the eyes were present on lateral rotation of the eyes. The Wassermann reaction was negative in each instance.

Dr. Fraley, in discussion, spoke of a case which he had seen in the Out-Patient Department in the Children's Hospital in 1913, which was afterward referred to the house on Dr. Hand's service. This child was a girl of five years, who was born in Philadelphia and had always lived in its vicinity. Her chief symptom was prolonged and distressing diarrhea. The child had the same type of eruption as exhibited by Dr. Drayton's patients. The diagnosis of the condition had been at first tuberculous enteritis. Dr. Hand felt uncertain of the diagnosis of pellagra. However, the case was seen by several Southern physicians, who were then on a visit to Philadelphia, and they felt sure that the child had pellagra. She was removed from the hospital, and died a few days later, but no autopsy was obtained.

Dr. Le Boutillier's paper dealt with the weight of the thymus gland in health and disease, its anatomical position and the fact that enlargement causes pressure in varying degrees upon the neighboring structures, especially on the trachea. A report of 4 cases was made:—

(1) Case of status lymphaticus with a thymus weighing 65 grams, where death was due to pressure on the base of the heart and its ganglions.

(2) A clear case of tracheostenosis due to an enlarged, firm thymus, weighing 29 grams, the specimen showing the constriction of the trachea to a marked degree.

(3) Case of thymic asthma in a boy two and one-half years of age, admitted to the Hospital for Contagious Diseases for laryngeal diphtheria on three different occasions, but having no evidences of diphtheria. X-ray confirmed diagnosis of enlarged thymus.

(4) Enlarged thymus associated with a simple goiter in a girl of fourteen, X-ray showing the condition.

Surgical treatment gives a high mortality with fair results.

From our present knowledge, the use of the X-ray appears to be of greater value in this condition. In conclusion, it is of great importance to make a thorough examination in the region of the thymus gland in children, especially where there is a history of dyspnea or cyanosis; the importance of the X-ray in confirming such diagnosis and the probability of sudden enlargement of the thymus gland in derangement of the general arterial system, which may be great enough to cause death from pressure, and that tracheostenosis is a positive cause of death, and, in case of goiter, one must not forget the possibility of an enlarged thymus. The need of further study as to the internal secretion of the gland was emphasized. (See ARCHIVES for May, 1915.)

DR. COPLIN, in discussion, said that for some years he has been interested in making a collection of thymus glands, several of which were from cases of so-called thymic death. He then showed specimens of thymus glands of several different types. He recognizes morphologic types: (*a*) planotriangular, (*b*) bilobate, having no middle lobe, (*c*) thoracocervical, (*d*) conglomerate, and (*e*) unilobar. He then showed specimens of these different types.

Dr. Coplin spoke of the difference in colors of the thymus body from patients in whom thymic death had occurred. He thought there might be a specific thymochrome and that some relation between functional activity and the color of the organ might be shown to exist. The possibility of compression by the thymus body depends a great deal on its shape and thickness. There are certain types, for instance, the conglomerate, which may by pressure exert a definite influence on adjacent organs, notably the trachea; and others, for example, the unilobar and planotriangular types, would be very unlikely to cause pressure. Some of the specimens that he exhibited showed compression. He does not believe intoxicant properties of the thymus have been proven to exist, although the possibility of such substances could not be denied.

He is much interested in the question of mononucleosis in thymic hypertrophy. Enlargement of the thymus, as in exophthalmic goiter, may be attended by mononucleosis. Several observers, including Halstead, have called attention to the fact that partial thyroidectomy or ligation of nutrient thyroid arteries in exophthalmic goiter might lead to clinical improvement without change in the mononucleosis; if thymus is removed the mononucleosis might disappear. He thinks that the X-ray may be very misleading, and he has seen autopsies which proved this fact. The French have called attention to the specific shape of the X-ray shadow. One misleading feature in postmortem studies is the change in the gland after death due to the subsidence of edema. Dr. Coplin has tried to produce artificial edema in these glands, and in one instance has increased a displacement of the thymus in water by 16 per cent. In the present state of our knowledge, data yielded by study of gross morphology appear to be more valuable than those obtained by histologic examination alone.

Dr. Griffith, in the discussion, said that for many years he had been interested in the thymus gland from a clinical standpoint, and that he had looked largely into the literature of the subject. He believed that there are but two possible conclusions to which one could come. First, there undoubtedly exists a class of cases in which the thymus gland exerts pressure upon the trachea, and could occasion death in this way. This has been proven beyond question, especially by the immediate benefit following operative interference. There are, however, very many cases claimed to be of this type which do not belong here. In a medical contribution published some years ago he had been able to find only 10 undoubted cases of pressure by a hypertrophied thymus, proven to be so by operation. Of course, other cases have been encountered since that time; and the employment of the X-ray for the cure of such cases has also come into prominence. He had one extremely interesting case of this nature, in which the thymus could be seen to diminish and the symptoms of stenosis gradually lessened until they entirely disappeared. All the cases of this type have one thing in common. They are subject to more or less constant stenosis, giving always full warning that there is something interfering with respiration.

The second class of cases is a large one, and is of the type in which sudden death occurs without discoverable cause. An autopsy shows an enlarged thymus gland. There is yet lacking satisfactory proof that in these cases the thymus gland has anything whatever to do with the sudden death. Reporting them as such is often an instance of imperfect logic. A sudden death occurs, and a large thymus is found; *ergo,* the thymus gland produced the death. It is unfortunate, indeed, that the term "thymus death" has ever been applied to cases of this kind. It is very possible that the enlargement of the thymus is an attendant circumstance. We do not know enough yet of the internal secretion of the thymus to have any reason to attribute death to this source. These deaths are really cardiac deaths, due, very possibly, to some toxic substance in conjunction with a sudden, extraneous exciting cause; but how this poison is produced and of what it consists no one knows.

Dr. Beardsley, in the discussion of "thymic death," spoke of the importance of early diagnosis. He mentioned the fact that the early and slight symptoms of this disorder were often overlooked or misinterpreted and thus proper treatment was not instituted. He thought that dyspnea on slight psychic causes (anger, fright or grief) was an important early symptom, especially if accompanied by slight cyanosis and tremors. These attacks in young children were often termed "holding the breath" spells by the mother and were often diagnosed "laryngospasm" by physicians who had not seen the attacks. Such a history of slight symptoms in the early stage of the disease has, not infrequently, been elicited from the family in cases resulting fatally in which no suspicion of the true nature of the disease had existed during life. It was not to be thought that every child who held its breath when it was not allowed to have its own way was a case of enlarged thymus, but such a possibility should be considered if other symptoms were suggestive.

Dr. Beardsley stated that he saw, through the courtesy of Dr. W. S. Lucas, of Wynnewood, a girl baby thirteen months old, whose symptoms were those above stated. Attacks of "holding the breath," slight cyanosis followed and at times accompanied by a tremor of the body and later by a period of limpness in which there was considerable sweating. An X-ray examination of this case by Dr. Willis Manges revealed a much enlarged shadow in the region of the thymus gland. This child received one treatment of the rays and had no attack for several weeks, despite the fact that previous to the treatment there were several attacks a day. An examination by X-ray subsequent to the treatment showed a greatly decreased shadow. This child will receive other treatments from time to time, but with a considerable interval between, not only to prevent burning a tender skin, but to avoid any possible danger of changing too greatly the physiologic changes in the thymus gland.

Dr. Manges said his first experience with this condition was about four years ago. A small patient having cough, dyspnea and cyanosis was sent to him and showed quite an expanded shadow in the region of the thymus gland. He was not sure whether this was an enlarged thymus gland or a dilated heart. This child was treated with small frequent doses of X-ray, and the attacks lessened in frequency markedly, and all symptoms abated. The child now is perfectly well. The second case he had was the one that Dr. Beardsley spoke of. He believes that the large single dose of X-ray is the more reasonable treatment. One reason for this is the quicker relief of urgent symptoms. The action of the X-ray is to produce atrophy of the gland.

Dr. Nathaniel Ginsburg discussed a case of thymic death which he had reported some years ago before the Pathological Society, at that time presenting the thoracic viscera of a child which died presumably of thymic disorder following a tonsil-adenoid operation. He had been much interested in this subject and, from dissections and studies which he has made in the young infant, he agrees with the speakers of the evening that there are two types of thymic death, one of which is the result of mechanical occlusion of the trachea from sudden enlargement of the thymus. It must be remembered, however, that a syndrome proceeds both from mechanical causes and that this syndrome is dependent upon a train of symptoms which always follow pressure on the innominate veins, then the innominate artery and finally the trachea, all of which are interposed between the non-resistant vertebral column dorsally and the sternum ventrally.

Thymic death following operations upon the thyroid gland is exceedingly rare. In spite of the few cases that have been reported from other sources, in thousands of operations performed in the Mayo Clinic at Rochester, so far as Dr. Ginsburg knows, thymic death does not appear as a post-operative complication.

It is not always possible to diagnose thymic enlargement by means of the X-ray, and many cases of supposed thymic enlargement, as shown by a shadow on an X-ray plate, are not accompanied by the clinical features of thymic pressure upon the adjacent viscera.

So far as operation for acute thymic enlargement is concerned, it has been successfully performed, either by hooking up the thymus in the suprasternal notch (Jackson of Pittsburgh) or by extirpation of the thymus where enucleation has been possible. The thymus itself is not very vascular, having rather a feeble blood supply, but its close anatomical relation to the base of the heart, the large blood vessels to which it is attached by means of its capsule, render its removal an exceedingly dangerous and difficult feat.

Dr. Mills, in the discussion, reported a case of enlarged thymus in which the clinical symptoms were verified by X-ray examination. The child had very large adenoids and tonsils, and an X-ray treatment of the thymus once every three weeks for several months brought about sufficient reduction in size to make it safe for him to take an anesthetic to have the adenoids and tonsils removed.

Dr. Le Boutillier, in ending the discussion, said he was much interested in seeing the types of glands shown by Dr. Coplin, as they helped him to realize more than ever how often hypertrophy was present without symptoms.

He showed a specimen of a trachea and thymus gland removed from a patient who died at the Philadelphia Hospital for Contagious Diseases. This child, who was three years and eight months old, had been in the hospital for a year and a half, having had a tracheotomy performed soon after admission. The case showed the fibrous blocking of the upper portion of the trachea above the tracheotomy tube. The thymus gland was found to be much enlarged and to be of the rather flattened-out variety, distinctly bilobate in character, the lobes lying on either side of the trachea and not causing any pressure symptoms.

In answering the question regarding the number of X-ray treatments employed, from reading the reports of X-ray work, he found that this depended entirely upon the type of case. In very severe cases, where the pressure symptoms were marked, treatments might be given every day or every two or three days. In other cases, once a week or once every two or three weeks would be often enough. He was interested to see the radiograph of the child, who, after one treatment, showed a marked decrease in the size of the gland.

Dr. A. Graeme Mitchell read a paper on "Leukocyte Counts During Digestion in Bottle-Fed Infants." In reviewing the literature on the subject, Dr. Mitchell finds that there has been comparatively little work done, but the opinion of the majority of writers may be summarized as follows:—

(1) In babies digestive leukocytosis is inconstant.

(2) In adults digestive leukocytosis is inconstant.

(3) A rise occurs in the early afternoon regardless of food.

(4) Animals such as dogs, cats and rabbits do show a leukocytosis after food high in protein.

(5) The majority of researchers think protein food to be necessary for the production, and a few think the whey and sugar content to be the cause.

It is significant that much of the work has been done on animals. The present report consists of a study of 50 children, on whom over 700 blood counts were made. The method of study pursued was to take a leukocyte count immediately before feeding, immediately after feeding, fifteen minutes after feeding, one-half hour after, one hour after, one and a half hour after, and so on every half-hour until the next feeding. The results of the analysis of these cases are interesting, in that physiological leukocytosis after feeding was not found in most instances, and the opposite condition of leukopenia prevailed. Of the 50 children, only 6, or 12 per cent., constantly showed an increase in the white blood cells during digestion, although 16, or 32 per cent., showed at times an increase, and at others a decrease. Contrasted with this, 28, or 56 per cent., constantly showed a decrease in leukocytes during digestion.

In considering the 120 series, 28.3 per cent. showed leukocytosis and 68.3 per cent. leukopenia. The remaining 3.3 per cent. were so irregular as to be undeterminable.

In the fourth-hour cases the fall in the count is greatest at one hour and reaches over 9 per cent., and in the third-hour cases is greatest between one and a half to two and a half hours, and reaches over 11 per cent.

As to why some children show leukocytosis and others leukopenia after food, and why the same child may show at times an increase and at times a decrease after food, this research offers no adequate explanation. Careful study of the cases as regards age, gain or loss in weight, character of stools, nature of food, temperature, and time of day did not show any definite relation. It might be added in this connection that 6 children were studied through a four-hour period, beginning at 9 A.M. and received no food then or for several hours before. These all showed a gradually decreasing leukocyte count.

A theory which may be offered here is that ingestion of food, and beginning of the activities of the gastrointestinal tract, both glandular secretion and muscular movement thus causing increased blood supply to the splanchnic area, may attract leukocytes away from the superficial blood, and result in a diminished number of cells when counted by the ordinary methods.

Conclusions—

(1) Bottle-fed babies do not constantly show digestive leukocytosis; in fact, the majority show a smaller number of leukocytes in the superficial blood after taking food than before.

(2) This decrease is greatest at from one to two and a half hours after food, and tends to rise before the next feeding.

(3) When a rise does occur, it is most frequently soon after feeding, and begins to decline in a half hour.

(4) Crying, struggling and chilling of the part from which the blood is extracted increases the count.

(5) There seems to be as yet no adequate explanation for the increase or decrease.

(6) Comparative counts should be made at the same time of day, and at the same time in relation to food.

Dr. Hill, in discussing Dr. Mitchell's paper, said that in looking up the literature on leukocytosis during digestion he was interested to see how little had been reported on infants. He mentioned the lymphocytosis which Schlesinger and others had found in intestinal infections in infants, and the decrease which Moro found in the number of leukocytes one-half to two hours after the ingestion of food. If, however, an infant exclusively breastfed be given cow's milk, there was an immediate leukocytosis.

Dr. Hill felt that the value of a total white count alone was much less than when accompanied by a differential count. Instead of a few cases as reported by others, the paper by Dr.

Mitchell seemed to stand out because of the amount of work which he had done on so large a number of babies.

Dr. Myer Solis-Cohen read a paper on "A Study of the Therapeutic Effects in Tuberculous Children of Various Tuberculins, Sera and Vaccines," which he was unable to abstract.

During the discussion Dr. Mills asked for the contraindications to the use of tuberculin; Dr. John A. Kolmer, if abscesses occurred; and Dr. McKee, if there had been any study made of the leukocytes.

In answer to the questions asked, Dr. Cohen gave the following answers:—

In regard to Dr. Mills' question, he would say that the only contraindication to the use of tuberculin in his experience was when the patient was desperately ill, and a far advanced case. In moderately advanced cases tuberculin was not contraindicated if given in proper dosage.

In answer to Dr. Kolmer's question, he would say that the abscesses occurred only from Sherman's vaccines, both the non-virulent and the mixed. These abscesses discharged for quite a while, and the scar remained for some time.

In answer to Dr. McKee's question, he would say that he had made quite a good many studies of the differential leukocyte picture, although none of the numerical white blood count. He was not able to give definite figures on this matter, as this part of the work was not completed, but in the few cases in which they had finished the study they found quite a marked increase in the number of lymphocytes and also of the polymorphonuclears with one and two nuclei—the first and second classes of Arneth.

DEPARTMENT OF ABSTRACTS

ORIGINAL CONDENSATIONS OF CURRENT PEDIATRIC LITERATURE
BY THE EDITORS AND THE FOLLOWING ASSOCIATES

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OVEREND, WALKER, M.A., M.D.: THE INCIPIENT PULMONARY PHTHISIS OF SCHOOL CHILDREN. (British Medical Journal, December 12, 1914, p. 609.)

The author calls attention to the frequent occurrence of incipient pulmonary phthisis among children between the ages of five and fifteen years, when the tuberculous process tends to become localized within the ducts and glands of the lymphatic system of the respiratory tract. He reasons that the child is exposed to an infection which may enter either by the respiratory or the alimentary channel. The clinical symptoms and signs of the infection are at first obscure, indefinite and due to a slow chronic absorption of the products of bacillary metabolism, and to compression upon adjoining structures by the enlarged glands. Delicacy of constitution, debility, disinclination for exercise, loss of weight and appetite, anemia and myoidema are common symptoms. If no definite cause for feebleness of health be present, such as adenoids, enlarged tonsils, etc., a thorough radiological examination should be made, as a means of securing exact information regarding the presence of the infection and definitely localizing the area. A detailed and well-illustrated description of the routine method followed by the author is given with interpretations of radiograms.

The treatment includes all hygienic measures, such as proper diet, graduated exercise, sea air, open-air school or entire freedom from school routine for several months. The use of virol, red-bone marrow, cod-liver oil, ichthyol in tabloid form and calcium sulphide are suggested. The author closes with a strong plea for a more general use of the X-ray as an aid in making a correct diagnosis of suspicious cases. E. T. W.

Fowler, Russell S.: Splenectomy for Splenic Anemia. (New York State Journal of Medicine, September, 1914, p. 435.)

Fowler calls attention to an interesting splenectomy performed upon an unusual case of anemia in a child fourteen months old and weighing 14 pounds, 2 ounces. The spleen was enlarged to six times its normal size. The patient had been restless and irritable for several months, losing greatly in weight. The operation, which is explained in detail, was performed April 23, 1914, and child was discharged from hospital May 27th much improved in condition. The blood examination at time of operation showed a hemoglobin of 50 per cent.; at time of discharge the percentage had risen to 65 per cent. E. T. W.

Witmer, Lightner: Clinical Records. (The Psychological Clinic, March 15, 1915, p. 1.)

The object of this analysis was to discover, through an intensive study of a small number of cases chosen by random selection, what information is secured about each case and how it is recorded. The study has yielded only moderately definite answers to the questions, for the reason that it has brought to light a great variability in the amount and kind of information recorded, and but slight consensus of practice in the manner of making the records.

In the portion of the records devoted to general information, it is found that among sixty-one items the number of answers recorded in the 40 cases ranges from forty down to three. The average number is nineteen; and the total number of items recorded is 48 per cent. of what it would be if all of the information were recorded for every child.

The results of physical examinations are recorded under twenty-five heads, and if they were noted in every case there would be forty entries under each head to cover the 40 cases. In point of fact the number of answers ranged from twenty-six down to one; the average is thirteen.

The records of the mental tests are far more scattered than those of the general and physical examinations. Among the 40 cases there are records of thirty-three different tests having been used. The most frequent of these was used twenty times, while the least frequent was used only twice. The average number of tests per child was between five and six, but an individual tabulation shows no tests at all recorded in 6 cases, while in 1 case there are records of twenty tests having been given to one child. The other cases are scattered between these two extremes.

One of the reasons for undertaking this study of 1,000 clinical records was to secure a list of questions and tests upon which clinicians were so generally agreed that it might be used as a minimum standard for all examinations. From his study Witmer does not believe that any short and concise filling the records will suffice for all psychological examinations. R. D. M.

HOLT, L. EMMETT: SOME MANIFESTATIONS OF INFLUENZA IN YOUNG CHILDREN. (New York State Journal of Medicine, October, 1914, p. 479.)

Holt calls attention to the fact that the term "influenza" is too loosely used and should be applied only to definite conditions which have been proven by special microscopic tests to be such. It has been determined that influenza is due to the bacillus influenzæ, and is often a complicating influence in pneumonias with unusual and often extraordinary fluctuations of temperature. He states that he knows of no disease in which such high temperatures are seen with so few general symptoms. There are clinical resemblances between whooping-cough and influenza which Holt believes have not been sufficiently appreciated, and explains in detail. March and April are the months when this disease is most prevalent, and because of its contagious nature special efforts should be made to secure a correct diagnosis.

Influenza is markedly prevalent in the wards containing patients suffering from bronchitis and pneumonia, and the fact that the temperature curve and the course of pneumonia are influenced by the influenza complication, no one on looking over the charts can question. To call every case having unusual temperature one of influenza is an error, but the fact that the infection causes very remarkable fluctuations of temperature in diseases of respiratory infections should certainly be more generally recognized.

Cases of respiratory infections complicated by influenza are seldom benefited by cold air, although fresh air is very much needed. Where symptoms persist the children should be sent South if possible.

No antipyretics were given; careful examinations of urine, ears, digestive tract and other organs were made to determine, if possible, whether there was any other factor present. Attention is called to the rare and unfortunate manifestation of influenza—either primary or as a complication—namely, meningitis, and to its treatment with injections of anti-influenza serum into the spinal canal. E. T. W.

nal of the American Medical Association, March 27, 1915,

HANCOCK, CHARLES R.: A CASE OF INTUSSUSCEPTION CAUSED BY AN INVERTED MECKEL'S DIVERTICULUM. (The Jour-
p. 1,065.)

The subject of this report was a boy two years old who was seen first on October 28, 1914. had always been in delicate health; during the first year of life had suffered from intestinal upsets. The mother had lost a boy from intussusception at the age of ten years. Forty hours before this case was seen by Dr. Hancock he was taken with severe pains in the abdomen with vomiting. The family physician was called and he gave one teaspoonful of almond oil and several enemas without result. The child began to have bloody stools. On admission to the Polyclinic Hospital his temperature was 103° and his pulse 160, and he had all the symptoms of severe shock. The abdomen was distended and very rigid, and especially over the left side, no tumor could be felt, and nothing could be detected by a rectal examination.

An X-ray picture was taken after allowing 1½ ounces of barium sulphate mixed with 4 ounces of water to flow into the rectum by means of a rectal tube. This X-ray picture located the site of the intussusception and the operation was performed at once. When the peritoneum was opened several ounces of straw-colored fluid escaped from the wound. The invagination, which was about ten inches in length, was withdrawn from the abdomen and reduced by gentle traction from above and by pressure from below. On its reduction it was found that part of the ileum, cecum and part of the transverse colon had been intussuscepted down to the sigmoid. A soft tumor could be felt through the intestinal wall in the lumen of the bowel, fixed to the wall of the ileum, opposite its mesenteric attachment, and about 12 inches from the cecum. The tumor proved to be an inverted Meckel's diverticulum. The patient made a good recovery and left the hospital on the eighth day after operation.

R. D. M.

WILLIAMS, ANNA WESSELS, M.D., CAUSES AND TREATMENT OF CHRONIC CONJUNCTIVAL AFFECTIONS IN CHILDHOOD. (New York State Journal of Medicine, December, 1914, p. 579.)

The author believes that the medical profession and school authorities should work together to prevent the spread of chronic conjunctival lesions. All cases showing secreting conjunctivitis of whatever grade should be treated in their homes as well as at the clinics. Special emphasis should be laid upon acute cases, since they may become chronic and act as carriers unless given immediate and minute attention. The physician should be sure of a cure before dismissing a case. The author believes that the ideal method, and also the most efficient way of reaching the cases which are so prevalent among the poorer children is by cooperation between the Health Department, the Educational Department, and the dispensaries. Ophthalmia schools, school clinics, summer camps, mothers' demonstration classes, home instruction, and "follow-up" work are a few of the practical suggestions offered. Should trachoma at any time be introduced among our school children it may practically be controlled by the methods suggested in this article. E. T. W.

MCGLANNAN, ALEXIUS: INTESTINAL OBSTRUCTION DUE TO SIGMOID VOLVULUS. (Journal of American Medical Association, May 22, 1915, p. 1,744.)

Volvulus in childhood is a very rare condition. McGlannan's case was in a girl of six years, sick two days with cramps, diarrhea, vomiting and tenesmus. No blood was in the movements. She had a leukocytosis of 41,500, polynuclears 91 per cent. There was muscle spasm, more marked on the right side, and dullness in both flanks. At operation the belly was filled with straw-colored fluid and the small and large intestine distended but not inflamed. Appendix normal. The sigmoid loop presented in the wound was enormously dilated and found to be twisted through an arc of 300 degrees. The loop was untwisted and a rectal tube passed by the anus was guided into it. The abdomen was then closed and stimulation given. Reaction was severe but recovery ensued. Six weeks later resection of the sigmoid and anastomosis were performed. She was finally discharged in perfect health. C. E. F.

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ORIGINAL COMMUNICATIONS

CUBIC AIR SPACE FOR INSTITUTIONAL BOTTLE-FED INFANTS

BY THOMAS S. SOUTHWORTH
New York

This study of the cubic air space requisite for institutional infants had its inception as follows: The regulation of this matter in the State of New York is dependent upon the three-fold authority of the laws of the State, the rules of the State Board of Charities, and the regulations of the local Boards of Health. This leads to some apparent confusion and contradiction, as will be shown by the following extracts:

The public health law of the State, Chapter XLV. of Consolidated Laws, after stating their application "to every institution in this State, incorporated for the express purpose of receiving or caring for orphan, vagrant or destitute children, or juvenile delinquents, except hospitals," provides that:

"The beds in every dormitory in such institution shall be separated by a passage-way of not less than 2 feet in width, and so arranged that under each the air shall freely circulate, and there shall be adequate ventilation of each bed, and each dormitory shall be furnished with such means of ventilation as the local board of health shall prescribe. In every dormitory 600 cubic feet of air space shall be provided and allowed for each bed or occupant, and no more beds or occupants shall be permitted than are thus provided for, unless free and adequate means of ventilation exists approved by the local board of health, and a special permit in writing therefor be granted by such board. . . ."

The above law, which was apparently designed to cover well children in institutions, and not infants, and also specifically exempts hospitals, is quoted by the New York Board of Health and made the basis of their allowance of 600 cubic feet per bed in wards containing both sick and well infants, although in practice they at times calculate and issue permits for 50 square feet of floor space per infant if that allows a separation of 2 feet between cribs.

The State Board of Charities of the State of New York also points to the State law as its basic authority but in its own "rules" provides that:

"No patient shall be retained at public expense in any ward of any hospital, wholly or partly under private control, unless provision is made for each such patient as follows: In a ward which provides at least 1,200 cubic feet of air space for each bed or occupant thereof, and no more beds or occupants shall be permitted than are thus provided for, unless free and adequate means of ventilation exists, approved by this board, and a special permit in writing be granted by this board specifying the number of beds or amount of cubic air space, in no case to be less than 600 cubic feet for children under twelve years of age and 800 cubic feet for persons more than twelve years of age which shall, under special circumstances, be allowed . . . ."

Also "in a ward in which beds are separated at every point by passage ways of at least three feet in width and are so arranged that under each the air shall freely circulate and provide adequate ventilation."

This rule of the State Board of Charities assumes that persons over twelve years of age require more air space than children under that age. Taken in connection with the state law, its practical working has not only sanctioned quite generally a minimum of 600 cubic feet of air space for infants sick or well, but has been administered in such a way through the issuance of permits as to create a general impression that 600 cubic feet is an adequate maximum. Furthermore, the enforcement of the provision for free and adequate ventilation, upon which the licensing of this minimum depends, seems to cease with an inspection of the window space in each ward, without reference to their utilization.

For comparison, let us now turn to the clear-cut definitions and provisions of the ordinances of the City of Chicago, Article IX., ¶ 1213:

"For the purposes of this Article a hospital is hereby defined to mean any institution or place used for the reception or care, temporary or continuous, of two or more sick, injured, or dependent persons. . . . "

¶ 1218: "In every such hospital, each room occupied or to be occupied by patients shall be of such dimensions as shall give each patient not less than 800 cubic feet of space. Every such room shall have at least one window connecting with the external air for each two beds. Said windows shall be of such dimensions as shall secure to each patient at least 2,400 cubic feet of fresh air per hour by natural ventilation, or in case said windows shall not secure said 2,400 cubic feet of air per hour by natural ventilation, then each room shall additionally be fitted with such appliances for ventilation as shall secure to each patient in said room at least 2,400 cubic feet of fresh air per hour. Each bed shall have at least 80 square feet of floor space."

Please note that no distinction is made in Chicago between infants and adults, or between hospitals and institutions, and that provision is made that facilities for ventilation shall be used for that purpose.

The author's experience of eighteen years of nearly continuous connection with one or more of three institutions caring largely for bottle-fed infants, had impressed him with the belief that 600 cubic feet of air space per infant, under the average conditions obtaining in such institutions, was inadequate and contributory to their mortality.

In the hope of securing some definite data of value and authority, a questionaire was sent to each member of the American Pediatric Society. The scope of the inquiry was restricted, as far as possible, to bottle-fed infants under one year of age unaccompanied by their mothers.

Thirty-three answers containing sufficient data to incorporate were received from pediatricians in thirteen States, the District of Columbia, and Canada, who reported upon 49 hospitals and institutions containing infants, with which they were connected as visiting physicians.

In answer to the question, "What is the cubic air space per infant in your wards?" the wards of 21 were reported as having 1,000 to 1,500 cubic feet; of 8 as having 700 to 800; and of 5 as having from 300 to 600 cubic feet. Five physicians did not know the cubic air space per patient in their wards, but these and the majority of those reporting the smaller figures for air space laid especial stress upon open windows, free ventilation, and the employment of balconies or roof gardens.

An attempt to discover the extent of state or local regulation concerning required or minimum cubic air space per inmate, developed the fact that New York State (600), Evanston, Ill. (900), Chicago (800), and California (250) alone have such laws. The Minnesota law requires 50 cubic feet of ventilation per minute, per patient, but does not specify the cubic space per patient.

All answers were virtually in the negative to the question, "Do the authorities make any allowance of air space for adult attendants upon the infants?" It is so manifest that each adult attendant on duty in a ward consumes at least as much air as one of the children that it is somewhat surprising that no attention should be paid to this factor when calculating the proper air space per occupant and the permissible number of beds in a ward.

The next question was, "What is the minimum cubic air space with which bottle-fed infants do well in your wards?" The answers to this allow of no very definite deductions or conclusions. The large majority (21) frankly did not know, had not made any studies, or considered too many factors were involved. Naturally, those having abundant space had not been tempted to experiment with less; but some whose wards allowed 1,000 cubic feet or over considered that any reduction would be deleterious. On the other hand, 3 having 300 to 750 cubic feet considered their results good, though almost all of these made some qualifying remark concerning the number of windows, wide open windows, moving air, and free ventilation. One states that no amount of space is sufficient if windows are kept closed; another, that of two wards with equal cubic space (1,000 cubic feet) the infants did better in the one which had more sunlight and through-ventilation.

Concerning the question, "What is the desirable or optimum air space per crib in wards devoted to bottle-fed infants?" the answers were more definite. Some placed little or no stress upon space, but devoted all their energies to abundant ventilation. One wisely summed the matter up by saying that "it depended upon the position of the ward, the means of ventilation, and the free space about the building, also upon whether there were separate wards for night and day, and whether the wards were in upper or lower stories." To this might be added the capacity of the ward. Two considered 800 to 900 cubic feet sufficient, while five others believed that with satisfactory ventilation good results could be obtained with from 500 to 700. Ten were in favor of 1,000 cubic feet, and three others of 1,100, 1,200 and even 2,000 cubic feet, usually not without some stipulation for free ingress of fresh air. The belief was expressed that separation between beds of 2 meters (6 feet) was more vital than calculated air space.

In view of the apparent uncertainty in some quarters as to the relative requirements of adults and infants, it was deemed advisable to formulate the following question: "Do infants, in your opinion, require the same, less, or more air space than adults in wards devoted solely to the care of each group? Please give reasons for your opinion." Twenty-three expressed definite opinions. Nine of these declared categorically for "more"; 8, for the "same"; and 6, for "less." The latter group apparently based their opinions upon scientific grounds; the two former groups upon experience. The reasons for these opinions are interesting. Of those declaring that infants required less air space than adults, one answered: "Much less; their lung ventilation is only a fraction of that of the adult." A second answered: "As a rule, somewhat less; CO_2 produced is much less in the infant than in the adult." A third answered: "I prefer more, but think they require less." This answer was somewhat difficult to classify. Two answered: "Infants require less, but relatively to their size, more, because of greater relative metabolism." "All metabolic processes are more active in the infant than the adult."

Those who believed that infants should have the same amount of air space as adults, based their belief upon the statements: "That it is difficult to treat children satisfactorily in hospitals; they do not stand confinement as well as adults." "On the principle that infants are more susceptible to their surroundings." "That there should be greater care in ventilation and frequent use of fresh, moving air—natural ventilation." "That one of the worst effects of over-crowding is the increased opportunity for ward infections of a respiratory nature, these being one of the greatest obstacles to success in feeding wards."

More air space than that allowed for adults is considered necessary by numerous others for similar reasons, namely, because they do best out of doors in winter; the more fresh blowing air, the better children thrive." "They are more susceptible to infection and more depressed by lack of fresh air and sunlight." "They must be widely separated because of the danger of slight infections in infancy." In this connection a very proper emphasis is laid on the floor space as well as the cubic space, and at least five to six feet between beds is recommended as desirable. The employment of screens between the cribs is advocated. Transfer of infections by contact, by over-worked attendants in over-crowded wards, must also be taken into consideration.

It has long been the conviction of the writer that nursing infants are more independent of their surroundings than bottle-fed infants. Even when cared for side by side in the ward, the progress of the nursing infant is usually favorable, while that of the bottle-fed infant is more uncertain. Much of this is due to the maternal nursing, but even in crowded wards the nursing infant apparently does well, whereas when deprived of the breast he does badly in proportion to the crowding. Believing, therefore, that artificially-fed infants should be especially provided with ample space, the following question was introduced: "Do bottle-fed infants require more air space than nursing infants?" To this, 11 answered "yes," 6 "the same," and 6 "no." One who answered no, asks, "Why should they?" This may perhaps best be answered by those who favored more space, whom I may quote as saying, "Nursing infants are apt to thrive in spite of their environment." "Bottle babies need all advantages possible to overcome the handicap of their artificial feeding." "They are more susceptible and in every way need more care."

Those who consider the same space sufficient emphasize that "Bottle-fed infants have greater need of ventilation—moving air," and that "More light and air go with better hygiene." The opinion that "all require the maximum amount of space" may be contrasted with regulations which practically authorize the employment of a minimum space for these unfortunate babies.

It was at one time common in literature dealing with the construction of children's hospitals to make a distinction between the requirements of cubic air space in so-called "medical" and "surgical" wards. For example, 1,000 cubic feet per patient would be specified for medical cases, and 1,500 cubic feet for surgical cases. In order to test this on the basis of wide practical experience, the following question was formulated: "Can any proper distinction be made between so-called 'medical,' 'surgical' or 'bottle-feeding' wards in the amount of cubic space necessary to each infant? Which, if any, requires the larger amount, and why? Please state the respective optimum amounts." No opinion was expressed by 12; 2 thought that the bottle-fed infant required more space than purely medical and surgical cases; 13 declared that no distinction could be made, which is equivalent to saying that the needs of the different groups is the same. The opinions were expressed that "at least 1,000 cubic feet are necessary for all," and that "all require frequent change of air and, as far as possible, open-air treatment and the use of sun parlors," and that "bottle babies should, if possible, be gotten out of doors"; "those with acute and minor illnesses, whose stay is short, demand less space than feeding cases whose stay is longer." Five took the position that certain special surgical and medical conditions require more than average space, even to the point of putting them by open windows and on open porches. Such were wounds with odor, septic and pyogenic infections, osteomyelitis, empyema, and acute fevers with delirium. Pneumonia was apparently overlooked.

The question, "Would you class the bottle-fed infants cared for in any type of institution as well infants or sick infants?"

was inspired by the impression created by the authorities controlling these matters in the State and City of New York, that not only the laws but they themselves looked upon infants placed as dependents in institutions as well infants, and the wards in which they were cared for as "well" wards, irrespective of the subsequent history of the infants while inmates. Of the 29 answers received, 3 considered them to be well. The wards of one of these allow 1,000 cubic feet and upward; another does not give figures for space, but enforces open windows and free ventilation; the third speaks of the greater susceptibility to infection.

The purport of the question not being entirely clear, 13 answered very properly that whether the infants are to be looked upon as well or sick depends on their condition. In this answer there is at least the tacit admission that all infants in such bottle-feeding wards cannot at all times be classed as "well" infants. Thirteen did not hesitate to say that bottle-fed infants should be classed as sick rather than well infants. Some of the reasons given for these views may be noted as follows: "It is quite possible for such infants to be well if proper care is given them; efficient service to each child is the important point." "Not all institution infants are sick infants; the answer depends upon the institution, the caretakers, the intelligence, fidelity and the number of the nurses, and the general hygiene of the institution." Another says: "Of course, well children should not be in an institution at all; those with digestive disturbances I consider sick." One considers the infants "well when of average or nearly average weight." Others, "when gaining well," but "if losing weight or stationary for any considerable period, or gaining very slowly, I should classify them as sick infants." Several from their experience say they are "usually sick," "generally sick," "almost always sick," "the majority may properly be classed as sick," "practically all suffer from chronic digestive disturbances." The position was also taken that "they should be classed as sick on account of the special care required in their nursing and in the preparation and administration of their food."

The significant question was then asked: "Do you consider limited cubic air space an important contributory factor to the high mortality of institution or hospital infants, especially among those bottle-fed?" Only 4 answers were in the negative; 28 answered yes. Most of the answers accepted limited space as an important and contributory factor; some as most important; others as contributory but not the only or principal factor. One states clearly from his experience: "I think the mortality rises steadily in proportion as the number of cases in the ward is increased."

CONCLUSIONS

Allowing for some divergence of opinion, as impartially stated in recording the answers received, the following conclusions seem to be justified:—

(1) The majority (21 in number) of the hospitals and institutional wards for infants from which reports of cubic air space were received provide 1,000 cubic feet and upward of air space for each inmate, and only 5 reported 600 cubic feet or less.

(2) Even with 1,000 or more cubic feet of air space, free ventilation is deemed highly important, and as the space decreases such free ventilation becomes more and more imperative.

(3) No allowance of cubic air space is at present made for the necessary attendants in wards.

(4) Reduced cubic air space means less square feet of floor space and less separation between cribs, with proportionately increased opportunity for the spread of cross infections. There is a growing belief that even with free ventilation separation of the beds plays as important a rôle as cubic space. Such adequate separation, however, is only attainable with large cubic air space.

(5) On account of their handicaps, bottle-fed infants are more liable to require more space than nursing infants.

(6) Bottle-fed infants require as much cubic space as so-called sick, "medical," or "surgical" cases among infants.

(7) The majority of pediatric physicians believe that infants should have as much cubic air space as adults, if not more, and this is especially true of bottle-fed infants, because they are more susceptible to infection, suffer in their nutrition in confinement, and notoriously do badly in all save the best equipped institutions.

(8) Bottle-fed infants when retained for any considerable length of time in hospitals or institutions cannot properly be

classed as well infants because a considerable proportion of them suffer both in their digestion and nutrition, as well as from acute intercurrent affections, and therefore require unusual attention in their feeding and general nursing care.

(9) Limited cubic air space, involving limited floor space, is an important contributory factor, though by no means the only factor, in the high mortality of artificially-fed infants, and such crowding in limited space is very commonly the concomitant—if not itself a cause—of faulty hygiene, insufficient care, and inadequate nursing.

(10) Even with a liberal allowance of cubic air space free and abundant ventilation is of equal importance. In addition, provision for roof-gardens, porches and sun parlors is advisable, if not imperative.

(11) The mere presence of windows does not of itself constitute ventilation, but their proper use must be provided for.

(12) A low minimum of cubic space established by law, without definition of what constitutes efficient ventilation, and without enforcement, may be more harmful than beneficial, and constitute a virtual license to overcrowd in ill-ventilated wards.

(13) The example of the more progressive hospitals and institutions, which provide the larger amounts of air space per infant, together with free ventilation, is to a considerable extent nullified by state and local regulations licensing for the less progressive the employment of minimum air space (contrary to the majority opinion of those best qualified from experience to be judges) for a class of infants among whom there is admittedly an unduly high mortality.

807 Madison Avenue.

MICROSCOPIC EXAMINATION OF DIPHTHERIA BACILLI—Nielsen (Hospitalstidende, Copenhagen, March 3, 1915, Vol. LVIII., No. 9, pp. 201-224) examined under the microscope smears from 215 patients entering the hospital for suspected diphtheria or scarlet fever. Cultures made from the same smears gave positive findings in 165, and, of these, he obtained positive findings in 80 per cent. with his stain-microscopic examination. In all of the 50 negative cases the microscopic and culture methods gave parallel results.—*Journal of American Medical Association.*

PROPHYLACTIC VACCINATION FOR VARICELLA*

BY SOPHIE RABINOFF, M.D.
New York City

During an epidemic of varicella in the wards of the Hebrew Infant Asylum during the winter just passed, the opportunity presented itself to try out prophylactic vaccination. Inoculations of this kind have been described by Kling, of Stockholm, and were carried out later by Handrick.

Before detailing some of our work, let us review briefly the technic of the methods and the results obtained by these investigators.

In pursuing his work, Kling uses the following technic: The vesicle of a fresh case of varicella is used as the source of the virus. This is pierced with a "vaccination lancet," with which several superficial skin punctures are made for the purpose of vaccination, care being taken to avoid drawing blood. After making three punctures the lancet is introduced into a fresh vesicle, and further inoculations are carried out, making six in all. Kling lays emphasis upon the necessity of obtaining the virus from a case in the early stage of the disease, when the contents of the vesicles are clear and the vesicle itself surrounded by a slight red areola. In his experience only 5 per cent. of the vaccinated cases showed reaction at *all* the points of inoculation, although in every case one point at least showed some reaction. This appeared about the eighth day in the form of a vesicle or a group of vesicles, which very soon dried up, leaving a slight scar. There were 95 children in his institution. Among the 64 unvaccinated cases about two-thirds developed varicella, whereas, among the 31 vaccinated, only 1 showed a generalized distribution of vesicles.

Handrick, following Kling, also tried prophylactic vaccination, but met with less success and was inclined to consider this method of little value. At first he made scarifications as carried out in the von Pirquet tuberculin test, but later employed Kling's technic. He vaccinated 127 cases and obtained a local reaction in only 3. These 3 cases in a day or two, however, showed distribution of vesicles over the entire body. In summing up his results, 45 cases of varicella developed among 127 vaccinated children. In view of the very high degree of contagiousness of this disease, particularly during an epidemic, we are inclined to think that he did procure a definite degree of protection.

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* Presented before the Pediatric Section, Academy of Medicine, May, 1915.

While varicella is in itself not a very serious disease, nevertheless, in an institution which cares for over 400 children, the seriousness and inconvenience of an epidemic and the value of some prophylactic therapy is evident. Successful vaccination would be welcomed if it could limit the spread and development of an epidemic.

The chief problem has been to obtain virus. Varicella differs from variola in that animal inoculations have been thus far unsuccessful. The only recourse at the present time seems to be the contents of the lesions in an active case of varicella. Early in the disease, while the vesicles are clear, some material can be collected in sterile capillary tubes and transported for use elsewhere. This allows of what may be termed an indirect method of vaccinating. However, this is not always feasible, as frequently the vesicles are very small, containing only a minute quantity of material, and may dessicate rapidly and become pustular, so that it is impossible to obtain virus in capillary tubes.

In the majority of instances it was therefore necessary to use material directly and immediately from either the vesicles or the pustules. Of course, the presence of any transmissible disease in the donor must be considered and guarded against. Lues, particularly, must be borne in mind. In the Hebrew Infant Asylum, while the Wassermann reaction is not done as a routine procedure, all suspicious cases are subjected to this test, so that the danger of transmitting this disease is ruled out.

The method we used was similar to that of Kling, except that instead of multiple punctures small scarifications were made on the arm to be vaccinated. In the first group of cases which were vaccinated, comprising about 50 children, only one scarification about ⅛ inch long was made, with the result that the local reaction was either very slight or did not occur at all. In the subsequent group, comprising about 60 children, three or four scarifications were made. In the latter series, a slight reaction occurred which could not be called typical, except in one instance. Three scarifications were made in this particular case, and about the tenth day there appeared a slight red areola at one point of scarification. This went in regular sequence through all the stages of papule, vesicle, pustule and crust, healing after the manner of a vaccination lesion. In none of the vaccinated cases was there any evidences of systemic disturbance.

Varicella is one of the most highly contagious diseases, spreading through an institution for children, and allowing very few to escape infection. During the recent epidemic at the Hebrew Infant Asylum this peculiarity was well illustrated. In one ward, for instance, among 38 susceptible children, 32 developed varicella. In another ward, among 28 susceptible children, 21 came down with the disease. In the nine wards shown in the accompanying table, all the children were exposed to the infection. It so happened that in every instance where there were vaccinated children, three or more cases of chicken-pox had already occurred in the ward, and further cases developed.

The results are best illustrated by the accompanying table. Most of the children are in the institution from infancy, and we keep careful and complete records of the history of each and every child, so that it is possible to exclude from consideration those children who were protected by a previous attack. The table is arranged to show the total number vaccinated, those protected by a previous attack, and the susceptibles, comprising all not in these two groups. Let us see what happened in the various wards.

INCIDENCE OF VARICELLA AMONG VACCINATED AND UNVACCINATED CHILDREN

Ward No.	Status of Wards				Ages in Years	Date of First Infection in Ward 1914	Date of Vaccination	Varicella Developing Subsequently			
								Vaccinated		Not Vaccinated	
	Total Vacc.	Varicella Previously	No Varicella Previously	Susceptibles				Cases	Dates	Cases	Dates
I	1	0	1	38	1-12 to 1	Nov. 17	Feb. 2	0	....	32	Nov. 17 to Feb. 19
II	32	14	18	2	1-2 to 1 1-2	Nov. 27	Dec. 31	2 1	Jan. 1 Jan. 11	1 1	Jan. 2 Jan 6
III	30	11	19	8	1 1-2 to 2 1-2	Nov. 23	Nov. 29	2 1	Dec. 6 Dec. 8	6	Jan. 18 to Mar. 2
IV	30	12	18	4	2 1-2 to 3 1-2	Nov. 17	Nov. 30	0	....	2 2	Feb. 1 Feb. 2
V	20	0	20	3	1-12 to 2	Feb. 1 1915	Feb. 2	0	....	3	Feb. 12
VI	....	12	....	20	3 1-2 to 6	Nov. 2	....	......	....	14	Nov. 2 to Feb. 2
VIII	....	9	....	20	1-2 to 2 1-2	Dec. 14	....	......	....	15	Dec. 14 to Jan. 21
X	....	2	....	28	3 1-2 to 6	Nov. 18	....	......	....	21	Nov. 18 to Jan. 30
XI	....	1	....	19	3 to 4	Oct. 18	....	......	....	17	Oct. 18 to Feb. 12
			76	142				6		114	

In going over the table there are certain salient points which claim our attention. For example, in Ward I., containing 38 infants ranging in age from one month to one year, 32 cases of chicken-pox developed. One vaccinated case happened to have been transferred to this ward, and it is interesting to note that this child did not develop varicella. On the other hand, in Ward V. twenty children of similar ages were vaccinated, and although 3 active cases of chicken-pox broke out in this ward, not one of the 20 developed the disease. The same striking contrasts are seen in the other wards, between the vaccinated and non-vaccinated children. It is worthy of note that in Wards III. and IV., while among 12 susceptible children 10 cases of varicella developed subsequent to vaccination, among the 37 vaccinated children only 3 cases appeared. The results in the wards where vaccinations were done are strikingly uniform. One is further impressed by the large proportion of cases which develop among exposed susceptible children.

I wish to express my heartiest thanks to Dr. Alfred F. Hess and Dr. Sidney V. Haas, on whose services the epidemic occurred, for their assistance and coöperation.

CONCLUSIONS

Among the group of 142 susceptible children, 114, or about 75 per cent., developed varicella. In the group of 76 vaccinated children there were only 6 cases, or about 8 per cent. of the total number. Of these 6 cases, 2 developed on the day following vaccination, 2 seven days later, 1 nine days, and the last ten days later. In other words, all the cases among the vaccinated children developed within the incubation period of the disease, which is about sixteen days.

In this epidemic the vaccinations undoubtedly limited the spread of the disease. The duration of this protection cannot at the present time be determined. However, we feel satisfied with the results of our experience with this form of protective therapy, and recommend its employment in similar institutions as well as in selected cases in the home.

Since reading the above paper, a case of varicella developed in one of the wards of our admitting building. Vaccination was immediately performed on the entire ward of twenty children. No other case of varicella developed in this ward for six weeks, and then one other case appeared.

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THE PHYSICAL EXAMINATION OF THE HEART IN CHILDREN

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Formerly too often the study of heart disease centered around an academic discussion of the origin and transmission of murmurs. We know today that the damage to the heart by an infection, as rheumatism, is not confined to the endocardium and valves and possibly the pericardium alone, but may extend to the myocardium and often the myocardial involvement is more important than the former. Thus the term myocarditis has regained for itself a right to existence. The question we ask today is not only the site or sites of the gross and microscopic anatomical lesions, but also the effect they have upon the working power of the heart. If the latitude of response to the varying demands for work are lessened by the disease, this fact is more important than the site of the pathological lesion. The recognition of the five physiologic functions of cardiac muscle, stimulus production, excitability, conduction, contractility and tonicity, the fixing of the site of the pacemaker in the sino-auricular node, the discovery of the auriculo-ventricular bundle and its function, have all given us a deeper insight into cardiac disease. Furthermore, the perfection of graphic methods gives us an insight into the seat of the lesions causing cardiac impairment we have never had before. They have placed the cause of the perverted actions of the heart on a scientific basis.

In taking up the physical examination of the heart in children in the time allotted, it will be possible often to refer only to salient points merely categorically.

First we shall take up the information to be derived by the ordinary procedure of inspection, palpation, percussion, auscultation and then proceed to the disturbances of the intrinsic rhythm of the heart.

By inspection and palpation we locate the apex beat. Its normal position is well given by Holt, who quotes Wassilewski and Starck, whose combined examinations were upon 2,100 children. A comparison of the skiagrams of the normal infant and adult shows that in the infant the higher position of the diaphragm causes the heart to lie higher and nearer the horizontal. Consequently the apex beat is farther to the left and above the point expected in the adult. The apex beat is, as a rule, outside the mammary line until the fourth year. If it is less than ¼ inch beyond the nipple it cannot be considered abnormal. From the fourth to the ninth year the apex beat is in or near the mammary line; after the thirteenth year under normal conditions it is invariably within the line. During the first year the apex beat is usually found in the fourth intercostal space. From the first to the seventh year it is found with equal frequency in the fourth or fifth spaces, and after the thirteenth year, when it is normal, it is always in the fifth space.

By percussion we determine the outline of the heart. It is better to percuss from the lung toward the heart. The estimation of the deep dullness is of most importance. Normally, at its widest parts, it extends ¼ inch beyond the right margin of the sternum to the left vertical nipple line and sometimes ¼ inch beyond.

By inspection and palpation alone cardiac *hypertrophy* may be pretty accurately surmised. The large area of pulsation and possible precordial bulging are suggestive. The peculiar thrust of hypertrophy is unique, with a large area of cardiac dullness to the left and a systolic thrust of an apex well outside the nipple line means left ventricular hypertrophy. Increased dullness to the right with a diastolic thrust in the epigastrium suggests right-sided hypertrophy. In systole the hypertrophied left ventricle thrusts the apex against the left wall. In systole the hypertrophied right ventricle retracts from the chest wall to rebound in diastole. A polygraph tracing of the apex beat illustrates this difference. Electrocardiograph curves show distinct characteristics in the left and right-sided preponderance, though their value is called in question now because we find the same picture in hearts apparently normal. The future must determine their worth. Adherent pericardium causes the most exaggerated hypertrophy. Left ventricular hypertrophy is secondary to regurgitant aortic disease, to periphereal resistance in children extremely rarely. Right-sided hypertrophy is secondary to acquired mitral stenosis and congenital pulmonary stenosis. Hypertrophy is relatively greater in children than in adults because of the greater reparative power of the youthful myocardium. Hypertrophy means resistance successfully overcome for the present. However, an hypertrophied heart is an impaired heart with a limited field of response to the demands made on it.

By inspection, palpation and percussion we may determine *dilatation* of the heart. Hypertrophy means difficulties overcome; dilatation in organic heart disease means failure under stress. Dilatation may be the first evidence of endocarditis. Then it precedes the development of a murmur. Increased cardiac dullness, rapid and perhaps irregular rhythm and possibly a muffling of the first sound at the apex, all may develop days before the murmur. This may mean that the thin myocardium of the child is affected as well as the endocardium and possibly the pericardium. In dilatation the deep dullness exceeds the limits described above if the left chamber is dilated to the left and vice versa. Palpation of the apex beat fixes the extent of the left ventricular dilatation, except in those rare cases of extreme dilatation of the right ventricle where the right overlaps the left ventricle, and becomes the apex. A polygraph tracing of the apex will help decide this point. In dilatation of the left ventricle the apex beat is usually displaced upward and outward, not downward and outward as in adults. All the signs of dilatation suggest weakness of cardiac action, hypertrophy strength. Dilatation of the right ventricle, especially in advanced heart disease, leads quickly to decompensation; edema, dyspnea, hepatic congestion, ascites generally follow.

Dilatation of the left side more often appears earlier in heart disease possibly from the myocardial involvement already mentioned. Dilatation has been confused with displacement due to pericardial or pleural effusion.

Dilatation of the heart may be functional as well as organic. In some children who appear to be in perfect health and whose later history confirms this, the apex beat will at times be found outside of these normal positions. Such dilatation is usually accompanied by accelerated pulse and often by systolic murmurs. In some children fever, emotional upsets, sudden exertion, may cause such a dilatation. Its characteristic is its intermittency: it disappears and reappears. It is to be looked for in pertussis even of moderate severity, in the nervous child referred to later under functional tachycardia and occasionally in hearts sometimes before subjected to acute infections when tried by sudden exertions, as in competitive games. The explanation of functional dilatation is, first, in convalescence, and in nervous children there is probably a lack of tonicity in the cardiac muscle, and, second, the heart of a child has a greater latitude of response to the demands made upon it. In the child the cardiac muscle has rarely, if at all, to contend with the common complications of the adult heart, arterial sclerosis, chronic renal disease, emphysema and bronchitis, alcohol and syphilis, so that the child's myocardium would naturally be expected to show an elasticity and resiliency unknown to the adult myocardium, and experience bears this out.

Pericarditis is revealed by palpation, percussion and auscultation. Examination of the heart shows friction, dilatation, rapid and usually irregular beat. These will usually be found in a child who has had recently some acute rheumatic manifestation. Sudden vomiting, precordial, epigastric, or even abdominal pain, fever, rapid pulse, dyspnea, cough possibly, and extreme restlessness may occur. Friction may be evident to both palpation and auscultation or it may be absent early or limited to a very small area. It may be hard to differentiate from a murmur where slight. Cardiac dilatation may be sudden, progressive and extreme, especially that of the right side of the heart. The dull area may extend from the right nipple to 2 or 3 inches outside the left nipple line. This greatly dilated heart with adherent pericardium simulates pericardial effusion. Frequently in such cases only 2 to 4 ounces of fluid will be found, evidently not a large element in the production of the dull area. Occasionally as much as a pint is found. Pericarditis with much effusion may be difficult to diagnose from dilatation. Sacculated empyema of the left side may simulate large pericardial effusion. In the former the heart is pushed to the right. Pleurisy, especially of the left base, is common in pericarditis.

By auscultation we study *cardiac murmurs,* both intra- and extracardiac. They may be divided into functional and organic, including endocardial or valvular, extracardial and congenital. The latter are largely due to malformations of the heart and its great vessels.

Functional murmurs are common and usually systolic. The commonest are pulmonary systolic, functional or physiologic mitral systolic and cardio-pulmonary.

The pulmonary systolic point of maximum intensity is the left second interspace at the edge of the sternum. It is soft, blowing, short, poorly-transmitted and follows the second sound immediately. It is probably due to the inrush of blood from the large right ventricle to the narrower vessel. It disappears usually at puberty, but may persist. It does not mean cardiac disease.

It is distinguished from pulmonary stenosis by the fact that the latter murmur is rougher, harsher, transmitted better and farther. In health the pulmonary second in children is louder than the aortic second. In pulmonary stenosis the pulmonary second is lessened and there is usually right ventricular hypertrophy present.

The functional mitral systolic is so common as to be called physiologic by some. It occurs in children from two to six years. It is heard after exercise, during convalescence, after infectious diseases and in the debilitated and anemic, and often in the perfectly normal child. It has been suggested that it may be due to a lack of tonicity in the cardiac muscle. It is found midway between the left border of the sternum and vertical nipple line just below the level of the nipple. It is not transmitted to the axilla or posteriorly, it is systolic, small, soft, varying, disappears and reappears with changes in posture. It has been compared to the twanging of a piece of tense string. It may persist for months and if it is the only sign of cardiac disease it is negligible.

The cardio-pulmonary murmur is usually heard between the ensiform and the apex. It is systolic, soft, increased on inspiration and diminished on expiration and disappears when the breath is held. The cause is friction between the heart and lung. It may occur in the normal heart or where cardiac disease exists.

Organic Murmurs—Endocardial or valvular. The following general considerations have great weight in diagnosis. Roughly, 99 per cent. of endocarditis in children is rheumatic. Rheumatism under three years is rare, under two years practically unknown. A murmur in a child under two years is functional or congenital. Rarely malignant endocarditis occurs in infancy, but there is always a demonstrable focus of infection, as empyema. The maximum of active rheumatism in childhood occurs from five to ten years.

Mitral Murmurs—The vast majority of children with rheumatic endocarditis show only mitral disease. The numbers showing simply a mitral systolic at the apex and a mitral systolic and diastolic at the apex are practically even. All diastolic mitral murmurs point to a mitral obstruction. The prolonged rumbling presystolic common in adults when found in children also points to an advanced process with narrowing of the mitral orifice. A short, sharp presystolic, a mid-diastolic or an early diastolic all may occur where there is simply inflammatory thickening of the valve and no contraction of the mitral opening. Therefore the latter are commonly more amenable to treatment than the former.

Aortic murmurs are rare among children as compared to adults. They are commoner from ten to fifteen years than earlier. Aortic disease in children without preëxisting mitral disease is rare. Postmortem aortic disease that gave no signs during life frequently occurs. Evident aortic disease in children shows a systolic and diastolic murmur sometimes heard better over the mid-sternum and on the left in the second and third interspaces at the left parasternal line, than on the right side.

In rheumatic endocarditis in children an aortic diastolic alone may occur, but almost never an aortic systolic without an aortic diastolic. In young children an evident aortic systolic murmur alone suggests a congenital aortic disease.

Tricuspid insufficiency is usually secondary to disease of the left side of the heart in its later stages. It is usually a relative insufficiency following dilatation of the right ventricle in mitral diseases. The systolic murmur of tricuspid incompetence is heard best over a small area at the lowest part of the body of the sternum. It is often hard to differentiate from a mitral systolic. Even when the pulse is regular the polygraph often shows the ventricular form of venous pulse in tricuspid disease.

Congenital Heart Murmurs—In a young child the question arises, Is a given murmur from acquired endocarditis or is it congenital? Certain general points give a clue. Rheumatic endocarditis is practically unknown under two years. Acquired endocarditis in infancy is practically never primary and the focus of infection is usually obvious. So a cardiac murmur in infancy is usually functional; it may be congenital.

Congenital heart disease means usually congenital cardio-vascular malformations. Other malformations in young children with evidence of heart disease is suggestive. The combination of malformations in congenital heart disease are so many that it is next to impossible to diagnose the exact lesion. A knowledge of the commonest abnormalities helps to a surmise. The commonest of all malformations is patent septum ventriculorum; next is pulmonary stenosis. The two are frequently combined. The third are the aortic abnormalities. Widely opened patent foramen ovale is rarest of all. Roughly only a third of the cases of congenital heart disease may show cyanosis.

In auscultation in congenital heart disease the most important point is the location of the point of maximum intensity of a murmur. Due to a thin chest wall the diffusion of a murmur in children is greater than in adults, but with care a maximum point may usually be found. In congenital heart disease this point is in an area where you would not find the maximum intensity of a murmur of rheumatic endocarditis. Either pulmonary stenosis or patent septum ventriculorum occurring alone give rise to a systolic murmur heard over a large part of the pericardium, but the maximum intensity of each is in a well-defined area. In congenital pulmonary stenosis this area is the second left space or third left costal cartilage close to the left edge of the sternum. Its murmur is harsh, rough, well transmitted to the left and there is more or less cyanosis as well as right ventricular hypertrophy. In patent septum ventriculorum the point is over the fourth left space or adjoining costal cartilage close to the left edge of the sternum. Its murmur is small, blowing; there is no cyanosis.

Patent ductus arteriosus occurs infrequently and more rarely alone. It shows a characteristic murmur. This murmur runs through both systole and diastole. It is increased during systole and increased by inspiration. Its point of maximum intensity is about 1 inch to the left of the left margin of the sternum in the third left intercostal space. In congenital aortic stenosis due to more or less fusion of the valves there is a rough systolic murmur in the second right space. Congenital affection of the mitral valves is extremely rare, so that an apical murmur in congenital heart disease is rare. True, a murmur is often heard at the apex in congenital heart disease, but careful auscultation will always show that the maximum intensity is not at the apex, but at a higher level or much nearer to the left edge of the sternum.

Electrocardiographic curves are helpful in the diagnosis of congenital heart disease. The greatly increased amplitude of the ventricular complexes alone is suggestive. These, combined with the marked evidence of right-sided preponderance in pulmonary stenosis, are commonly found. The whole subject is in its infancy. Comparison of galvanometer curves and postmortem findings will eventually decide the usefulness of this method of examination.

Disturbances of Rhythm and Rate—The maximum efficiency of the heart depends upon its normal ventricular rate and regular rhythm. This depends upon the generation and discharge of impulses from the pacemaker at the regular intervals. The normal rate and rhythm may be disturbed from factors without through the vagus, which is the inhibitory nerve of the heart, or from changes within the cardiac muscle itself. These changes may occur in hearts with gross anatomic changes, with microscopic changes, or where no changes at all are demonstrable. Since in the last decade we have been thinking in the terms of what a damaged heart can do, we have often approached the subject of diagnosis by a study of its rhythm and rate. Abnormal action of the heart is shown in irregularities, acceleration and retardation of the pulse rate. All three may be functional or organic.

Children especially are liable to these functional disturbances. This is true because a growing child has an unstable nervous organization. The same sharp reaction in temperature which we so often see has its counterpart in the rapidity of pulse rate under reflex stimuli. The vagus and vasomotor centers, like the rest of the nervous organization, are unstable in their function. These functional disturbances consist in irregularities, accelerations and retardation of the pulse, as before stated. They are frequently accompanied by symptoms and even by signs, which suggest organic heart disease. The objective signs consist of the disturbance of pulse rate, but at times in a certain amount of dilatation and more often of cardiac murmurs. We shall then consider briefly seriatim the following functional disturbances in the child: irregularities, tachycardia, bradycardia; functional murmurs and dilatation have already been mentioned.

We shall find that the same disturbances occur in organic heart disease. Here we are dealing with a physiologic phenomena apart from any pathologic condition.

The irregularities found in hearts that are, to the best of our knowledge, entirely normal, hence called functional irregularities, are sinus irregularities, premature beats or extra systoles, and a combination of the two. All the irregularities, whether in functional or organic disease, are best depicted by the electrocardiograph, many sufficiently well by the polygraph, and there are some peculiarities which help us to detect them clinically without the aid of graphic methods.

Sinus irregularities are also known as vagal irregularities or youthful irregularities. This irregularity arises in the sino-auricular node, which is the normal pacemaker of the heart. The pacemaker is controlled by the vagus or the inhibitory nerves of the heart. Recent experimental work suggests that the right vagus exerts its influence especially on the sinus node and on the auricles, whereas the left vagus has a predominant action on the auriculo-ventricular conducting system and the ventricles. This inhibitory action of the vagus upon the pacemaker varies. Increased vagal activity means a slowing of the rate of the pulse, decreased activity, increase of rate. A radial tracing in sinus irregularity shows that the variations are in the period of diastole. Galvanometer curves show that the impulse starts in the pacemaker, and that the chambers contract in regular sequence.

Sinus irregularity is common in normal infants, found as late as twenty to thirty years; any individual may show it sometimes. It is more common in children with nervous instability, especially after infectious diseases, as measles and influenza. It is found in intracranial conditions like meningitis and cerebral abscess. It is common in children with normal hearts and also those with genuine cardiac disease. It is the common irregularity of puppy dogs, whose hearts on examination have been found always normal. Clinically it may be recognized by paying attention to the following points: If the individual is breathing slowly and deeply, on inspiration we notice quickening of the pulse rate, and on expiration a slowing of the pulse rate. On holding the breath or breathing rapidly the irregularity disappears. On auscultation the heart sounds are present; the second follows the first at normal intervals, but the periods of diastole vary. Its greatest importance lies in the fact that it may be confused with other irregularities. It is not a sign at all of any cardiac disease. It is in the vast majority of patients associated with variations in respiration. Where it persists in sleeping and in genuine intracerebral trouble you will always find that the variations in respiration are present also.

Premature beats or extra systoles occur oftener among children with normal hearts than in those with damaged hearts. They are commoner during the second decade. The commonest form is the ventricular extra contraction, which has been found as early as two years. Though they show an increased excitability of the heart muscle they are comparatively unimportant. They are fleeting in character. They are common in neurotic children and arise from reflex stimuli. They disappear with increased pulse rate due to change of posture, fever, etc. Graphic methods diagnose them exactly. By auscultation we may diagnose the ventricular extra frequently. The character of the sounds depends upon whether or not the premature contraction opens the aortic valves. The diagnosis by auscultation is clearly explained by Lewis, in his "Clinical Disorders of the Heart." Not infrequently sinus irregularities and premature beats exist at the same time. The simple expedient of having children hold their breath for a short time may possibly cause the former to disappear and make the premature beats easier of recognition.

Functional Tachycardia—The normal pulse rate among children is higher than among adults, as is shown by the following tables:—

1. *Holt*—

Six to twelve months	105 to 115 per minute
Two to six years	90 " 105 " "
Seven to ten years	80 " 90 " "
Eleven to fourteen years	75 " 85 " "

2. *Nobecourt*—

Newborn	130 " 140 " "
First year	125 " 130 " "
Second year	115 " 120 " "
Two to eight years	90 " 100 " "
Eight to twelve years	80 " 90 " "
Twelve to fifteen years	76 " 80 " "

Furthermore, it is a common experience that among children fever, pain, exercise, emotion, may all cause a rise of pulse rate of 120 to 140, or even to 160, which subsides rapidly as the cause is withdrawn. In true functional tachycardia we must exclude all provocative causes. Any localized suppuration, latent rheumatism, cardiac dilatation—the result of old trouble—absorption from bad teeth, tonsils, diseased ears or disturbances of the thyroid, etc., must be excluded. Functional tachycardia is rare before five years, commoner in adolescence. Its characteristics are a pulse rate of, say, 120, which may run up to 140, or even to 160, under any of the already enumerated causative factors, but these removed the rate falls only to 120. This rate may persist for months, or even years, without any demonstrable signs of cardiac disease. That it is a chronotopic disturbance of impulse formation in individuals of unstable nervous development is shown by two facts—first, during sleep the pulse rate slows and may fall to normal; second, tracings and the electrocardiographic curves show that the impulses rise in the normal pacemaker, the sino-auricular nodes. The prolonged rapid rate of paroxysmal tachycardia which it simulates arises, as the curves show, in an ectopic focus; and at some time during our observation in the latter complaint we are apt to meet irregularities. There is a severer type among neurotic adolescents, often the children of neuropaths, subject to undue school strain or excitement, or after severe illness, as influenza, typhoid, pneumonia, etc.

They are frequently already, or should be, under the care of the orthopedists for corrective exercises. This fact points to congenital or acquired lack of muscular balance, showing an asthenia in which the cardio-vascular system shares. Teachers or parents report them dull, languid, poor of memory, emotional, crying easily, restless in their sleep. Such a child may complain of dyspnea, palpitation on exertion, vertigo or precordial distress, or headache, backache, or faintness, especially on arising or standing. Objectively the physician may find tachycardia, the pulse may run around 110 to 120, the pressure is low, the heart sounds are weak and of equal intensity, the hands and feet tend to be cold, clammy and often dusky. He may find cardiac murmurs, even intermittent dilatation and orthostatic albuminuria. Occasionally there may be, especially on arising or after standing, pallor of the face, faintness and even loss of consciousness. Such is the extreme picture. More commonly in these patients we will find simple acceleration of pulse with one or more of these signs or symptoms, which are enough to suggest cardiac disease to the parent or even to the physician. Often time alone will show that it is not cardiac disease, but the extreme limit of physiologic variation in a neurotic individual during adolescence. An unstable nervous system and not cardiac disease is the basis. The cardio-vascular nervous control is hypersensitive in the child with general lack of nervous equilibrium.

The French refer to this condition as orthostatic tachycardia. Nobecourt, in his recent work ("Cardiopathies de l'Enfance"), discusses the disturbed physiology of the circulation underlying this abnormal cardiac action.

Bradycardia—True bradycardia occurs more often without pathologic changes in the heart. The electrocardiograph shows that each ventricular beat is preceded by a single auricular beat and both are of the normal type. Thus the whole heart has a slow rate due to high vagal tone. They belong to the same class as the slow heart action of many healthy adults. Such a bradycardia in children is found in jaundice and in those convalescent from acute infections.

The Cardiac Irregularities of Organic Heart Disease—These kinds of irregularities can be accurately portrayed by graphic methods. We first seek to find out whether the origin of the irregularity is in the normal pacemaker or elsewhere. An irregular pulse is probably commoner in functional disturbances than in organic heart disease in children. One reason is that in children the greatly enhanced pulse rate abolishes some forms of irregularity. Many irregularities are much commoner where there are advanced changes in degeneration in the heart muscle. This is more usual in adults. In children irregularities of import occur more often in afebrile and quiescent periods.

Classification of Irregularities—(1) Those starting in the sino-auricular node, the sinus irregularities which we have already considered. (2) Those which show an ectopic focus as a starting point of the contraction are premature beats, simple paroxysmal tachycardia, auricular fibrillation, and auricular flutter. Heart block may belong to either group.

The diagnosis of these irregularities does not differ widely in children from adults. For that reason only a few points in the diagnosis and frequency of occurrence in children will be mentioned. Above it was said that the ventricular extra systole common in children with sound hearts was comparatively unimportant. However, in children with evidences of organic heart diseases, auricular premature beats should not be passed over so lightly. It is but a step from the single ectopic beat to the various ectopic rhythms. In half the cases of simple paroxysmal tachycardia, even in adults, there is no history of past illness but the diseases of childhood. It has been known to follow immediately on measles, malaria or scarlet fever. As would be expected, the commonest previous disease is rheumatic fever. Many cases show no cardiac lesion. The highest incidence is from twenty to thirty years.

Hutchinson and Parkinson report an interesting case of paroxysmal tachycardia, and collect many others in an article in the British Journal of Children's Diseases, Vol. II., June, 1914. Their own case was that of a boy of two years and nine months. Former disease, former infection, or signs of organic disease of the heart before, during or after the attacks were all lacking. Herringham reports a case of eleven years who probably had had attacks recurring since her fifth year. Sutherland, a boy of nine and one-half years, whose first attack probably began at seven and one-half years. Buckland, a girl of eleven, and Mecklen, a girl of thirteen years. Hay, a boy of six years and Hume, a boy of six years with diphtheria, from which he recovered.

With respect to diagnosis a rate of 140 or more, even in an adult, especially if a valve lesion exists, should arouse suspicion. In paroxysmal tachycardia this high rate persists standing or when recumbent. The abrupt onset and offset of the paroxysms, coupled with the presence of marked pulsation of the veins in the neck and of premature beats between the paroxysms, are highly suggestive. Cardiac murmurs, when present, even the presystolic of mitral stenosis, disappear during the paroxysms. It cannot be repeated too often that in these high rates the count should be taken at the apex. In the high rate of exophthalmic goiter and functional tachycardia the recumbent position reduces the rate. In this new rhythm posture, swallowing or holding the breath has no effect. A tachycardia maintained under the varying conditions suggests a new and ectopic heart rhythm. During the paroxysm in children the liver has usually been found enlarged.

Auricular fibrillation is uncommon in children. It has been demonstrated as early as five years, but then only in fatal cases like extremely bad rheumatism and diphtheria. It is extremely rare before seventeen. The clinical diagnosis of auricular fibrillation, apart from graphic methods, rests upon the persistent marked irregularity of the pulse.

When the ventricle beats irregularly at a rate surpassing 120 a minute the irregularity is almost always of this nature. When an irregular ventricular action accompanies signs and symptoms of serious heart failure, especially if the ventricular action is accelerated, it is probably auricular fibrillation. In patients with irregular ventricular action with normal or but slightly accelerated pulse rate clinical diagnosis is more difficult. In such a condition even slight exercise would increase the irregularity. In the irregularity due to premature beats exercise and increased pulse rate abolishes the irregularity. After exercise the irregularity of fibrillation decreases. The irregularity of premature beats increases. Fever increases the irregularity of auricular fibrillation, whereas it wipes out the irregularity of premature beat. Other irregularities may come and go, or at least you may find intervals of regular ventricular action, but, on the other hand, auricular fibrillation once found usually persists continuously. However, rarely paroxysmal attacks of fibrillation do occur.

In auricular flutter the age incidence is from five to seventy-four years. In 49 cases Ritchie found 2 under ten and 4 between ten and nineteen. Sutherland reports flutter in 2 girls, one six and one eight years. (British Journal of Children's Diseases, August, 1914.) The greatest liability to flutter is in old age. It is difficult of absolute diagnosis, except by the electrocardiograph.

Heart block is not common in children. A few cases have been recorded in diphtheria and tumors. It is remarkable that the auriculo-ventricular node and bundle are not functionally disturbed by acute rheumatic infections. As we gather more material we may find that it is not so infrequent as is now supposed. Lewis found a prolongation of the P-R interval in a boy with colon bacillus cystitis; with cure of the bladder the prolonged conduction disappeared.

In conclusion, I wish to express my indebtedness to Mackenzie, Lewis, Still, Ritchie, Holt, Sutherland and Nobecourt.

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OOZING ECZEMA—Unna (Berlin. klin. Woch., March 15, Vol. LII., No. 11, pp. 257-280) says that the simplest method of treating eczema with a serous discharge is to coat it often with a thin layer of a drying paste. This does away with the necessity for dressings and the cocci die off under the influence of the drying and reducing paste. The thinner the layer and the oftener it is applied the better. As the cocci die, the itching subsides. The formula he advises is a mixture of 10 parts sulphur lotum; 10 parts calcium carbonate and 80 parts zinc ointment. This paste is also useful to apply to a vaccination pustule as soon as the vaccine shows that it is going to "take." The course of the pustule is not interfered with, but there is no redness or swelling and the whole process is shortened.—*Journal of American Medical Association.*

OBSERVATIONS ON BIRTH-FRACTURES OF THE HUMERUS FROM THE WARDS OF THE NEW YORK LYING-IN HOSPITAL

BY EDWARD D. TRUESDELL, M.D.

New York

It is more than three years now since an investigation of the remote results following birth-fracture of the humerus was begun at the Lying-In Hospital. Interest was first aroused in these cases by a radiograph showing a fractured humerus in an infant three weeks old. Union was already firm, and the fragments had united in a position of excessive external angulation, the deformity seeming such as to seriously threaten the future usefulness of the arm, and to indicate the immediate necessity for some attempt at manipulative or operative correction. The evidence of the radiograph was disregarded, however, though somewhat reluctantly, and it was decided to keep the infant under observation, making additional radiographs at frequent intervals, the plan being to offer Nature the first opportunity to compensate for the deficiencies of the original treatment. Each successive radiograph revealed some decrease in the deformity; at first only sufficient to justify a postponement of, but finally removing all indication for, active interference of any sort. Other cases were added to the first during this time until a series of twenty-four fractures in twenty-one infants had been collected, all of which have been followed to their final outcome, radiographs and clinical examinations having been made at intervals in each case until this had been determined. In a few cases the deformity was extreme; in every case there was some. In no case have the radiographs failed to show a uniformly progressive elimination of the deformity, recording quite impressively the transition effected by Nature, from a distorted bone to one finally indistinguishable from its fellow of the opposite side.

Of the 24 fractures, 17 occurred during version with breech extraction, 4 during simple breech extraction, and 3 in vertex presentations, difficulty having been experienced in extracting the anterior arm, either because of narrowing of the pelvic outlet, or of the size of the child. In 3 cases the fractures were double, and of the 21 infants 17 had survived. In all cases but one the line of fracture was practically transverse, a typical pipestem fracture, the site of fracture being at or near the center of the shaft of the bone, just below the insertion of the deltoid muscle. In 1 case, a shoulder presentation, a fillet had been applied to the prolopsed arm and traction maintained on this during the version, causing some twisting or tortion of the extremity. In this one instance the line of fracture was oblique. Although no deformity was observed in some of the initial radiographs, displacement of the fragments was the rule sooner or later, this varying much in degree, and due to the activity of the infant, particularly the relatively strong deltoid muscle. The prevailing deformity was an external angulation attributable directly to the action of the deltoid, and quite excessive in a few cases. A second variety of deformity was a lateral displacement, the fragments lying parallel, but more or less separated. Overriding of the fragments was not noted in any case, nor was displacement in an anteroposterior direction. Each fracture was accompanied by a well-marked wrist-drop, due to some injury to the musculospiral nerve at the time of fracture, since the paralysis was immediate and so not likely due to accumulation of extravasated blood or callus inclusion. Two of the infants died soon after birth, affording opportunity for direct examination of the fracture. Extensive extravasation of blood was found in the deeper layers of the subcutaneous fat and among the muscle planes. Neither the musculospiral nerve nor the brachial vessels had been injured, although there was an extensive tear of the periosteum, through which the ends of the fragments could readily be made to protrude. The site of fracture in these cases was just below the insertion of the deltoid. The absence of gross lesions of the musculospiral nerve would be in keeping with the subsequent behavior of the paralysis, for this gradually disappeared during the first three or four weeks in the majority of the cases, and in none was evidence of it observed after the end of the sixth week. In 1 case the fracture was complicated by an Erb's birth palsy of the same arm. The repair of the fracture was as prompt in this as in the other cases, the bone finally uniting with a moderate degree of external angulation. At the eleventh month the paralysis showed no evidence of improvement, while the deformity had not diminished to the extent expected, in comparison with uncomplicated cases of the same degree of deformity. Two weeks after this observation the child fell from its sister's knee, a distance of not more than eighteen inches, refracturing the paralyzed arm. The fracture was an accurate reproduction of the original, and union occurred once more, though less readily than at first, and with no betterment of the position. It was found that a fracture of the shaft of the humerus in a child one year old was no easier to manage than in the infant.

The treatment of these fractures varied from time to time. The earlier fractures were put up with two or more small splints applied about the arm, the dressing held in place with bandages. This method not being satisfactory in all cases a splint of sheet aluminum was devised, moulded to embrace the flexed forearm on the arm, with an extension behind the back for additional security. Radiographs could be taken through this splint, which was somewhat complicated to construct and apply. Next a "V"-shaped splint cut from thin wood, deeply crotched at one end to fit the axilla, and applied to the inner side of the arm and flexed forearm, was employed, with good results.

In the more recent cases a broad swathe of adhesive plaster passing about the chest and fixing the injured arm directly to the side of the body has proved as satisfactory as the more complicated methods of treatment. The forearm is flexed upon the arm, the hand brought toward the opposite shoulder, the axilla protected by means of gauze or cotton, and the fractured humerus pressed firmly against the lateral chest wall by means of the encircling band of adhesive plaster. This method prevents the usual external angular deformities, particularly of the more excessive sort, and has the great advantage both of simplicity and security. The small size of the patient renders all bulky or complicated dressings impracticable, especially those tending to occupy much of the space between the arm and the body, thus favoring outward angulation of the fragments. At the end of the second week the radiographs show a well-developed and extensive callus mass, and by the end of the third week union is usually firm, the infant moving the injured arm freely. In no case has union failed to occur, although there has been some individual variation in the process of repair.

"Not infrequently in the treatment of these fractures considerable displacement will be found to persist, however careful may have been the endeavor to the contrary. A valuable opportunity is afforded at the end of the second week to forcibly correct external angulations, when these are present, as shown in the radiograph or upon direct examination. At this time the callus is still pliable, corrections made are most likely to be maintained, and much can be done to improve the position of the fragments in a fracture which perhaps has just come under observation or has been unsatisfactory for one reason or another during the early part of the treatment."

From the study of these cases it may be concluded that in a case of birth-fracture of the humerus a temporary paralysis of the musculospiral nerve is usual, that displacement of the fragments always occurs, the variety of degree of deformity being known only by means of radiographs, and that while every effort should be made to combat this deformity, Nature will so supplement the treatment of these cases as to ensure satisfactory results, eliminating deformities during the first two years of life that would be both permanent and disfiguring in adults.

Numerous fractures of the clavicle have been observed during the time spent in following up the fractures of the humerus. These have rarely been associated with fracture of the humerus. One of the cases of fracture of both humeri presented a fracture of both clavicles as well, while in 1 case there was a fracture of the humerus and both clavicles. In one instance there was a fracture of both clavicles, and in all other cases the fractured clavicle was the only injury. The radiographs have shown a transverse fracture near the center of the shaft of the bone, the displacement resembling that common in adults, the inner fragment being drawn upward, the outer downward and sometimes inward as well. The results have been uniformly good, and the treatment has been either with a figure eight bandage across the back or simple immobilization of the arm and shoulder by means of a Velpeau bandage. Occasionally these fractures have not been discovered until the appearance of the visible callus mass over the center of the clavicle; in other cases the infant's refusal to move the arm upon the affected side has suggested a birth paralysis rather than a fracture of the clavicle. Occasionally the fracture has taken place in a vertex presentation, during the delivery of the arm, but in nearly all cases the injury was done in the course of the more difficult breech extractions. Where difficulty has been experienced in the delivery of the arms and shoulders the humerus has been more frequently fractured than has the clavicle.

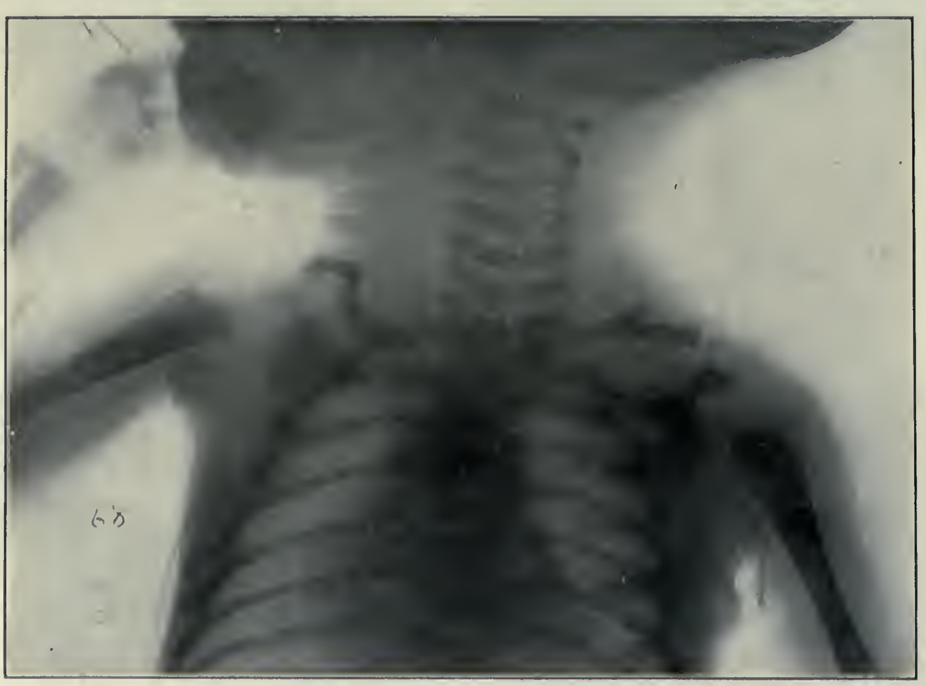

Fig. 1. Case A. Birth-fracture of the clavicle, showing the usual site of fracture, with the usual displacement of the fragments, similar to that seen in adults. These fractures, often unobserved before the development of the callus mass, repair quite promptly with simple fixation of the arm and shoulder, and, in all cases observed, without resulting disability or deformity of any sort.

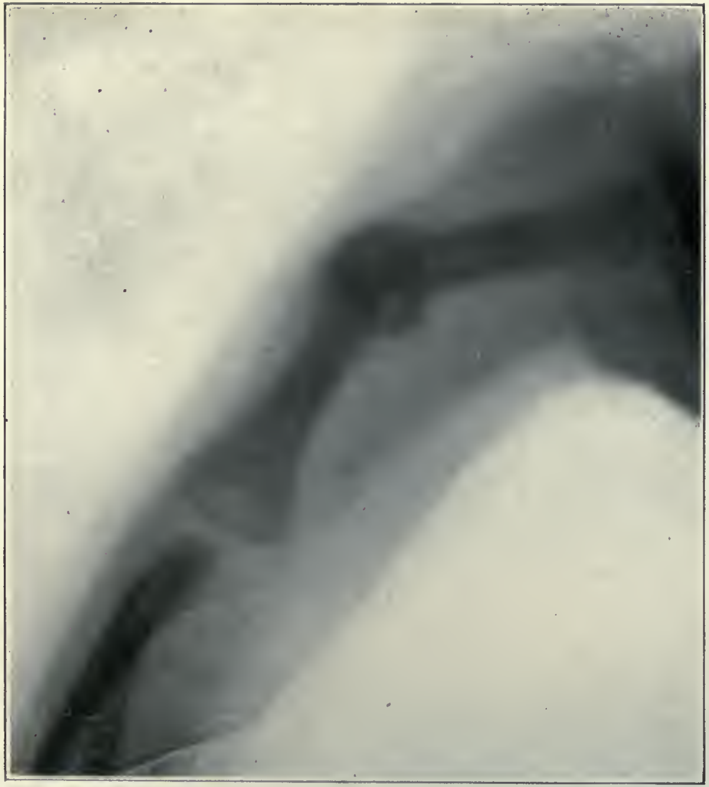

FIG. 2. CASE B. Birth-fracture of the humerus, first radiographed at the end of the second week, showing callus mass, with firm union, the fragments fixed in extreme external angulation. No attempt at forcible correction. Case kept under observation.

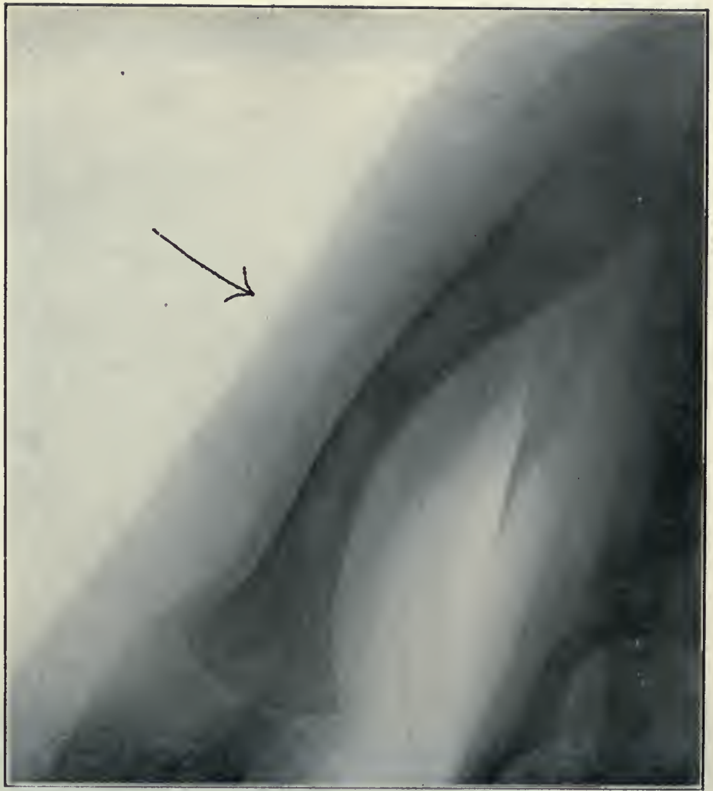

FIG. 3. CASE B. At the eighth month and without treatment of any sort nature had done much to correct the deformity, substituting a moderate external curvature for the original angulation. The medullary canal had been re-established.

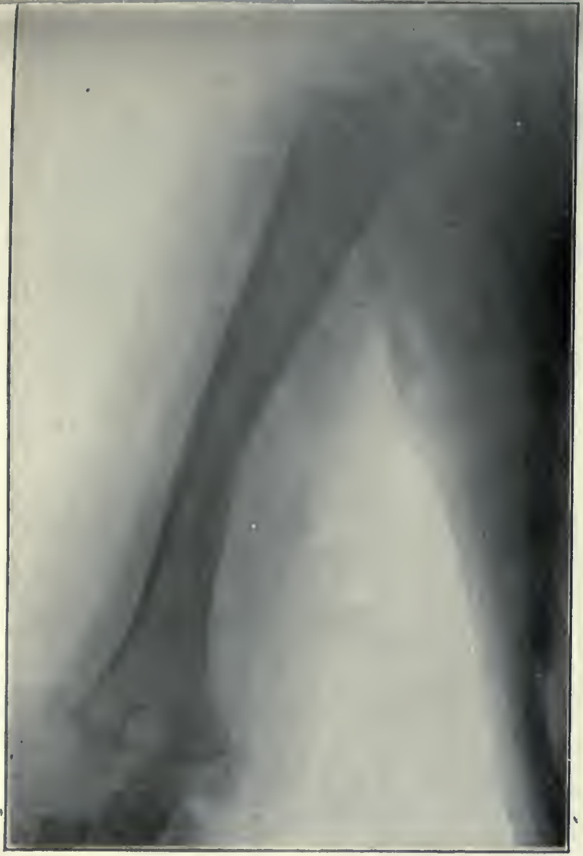

Fig. 4. Case B. At the eighteenth month the curvature had been largely eliminated, while the development of the bone had been unimpaired.

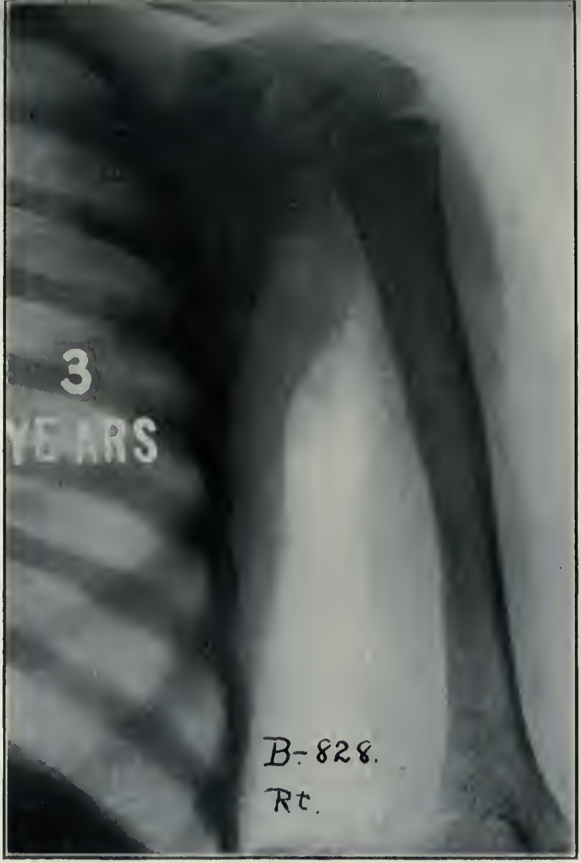

Fig. 5. Case B. Radiographs of both humeri at the end of the third year revealed little disparity. The bones were of equal length, functions of both arms were normal in every way, while the injured humerus still presented a slight outward curvature, insignificant when compared with the original extreme deformity. (Radiograph transposed.)

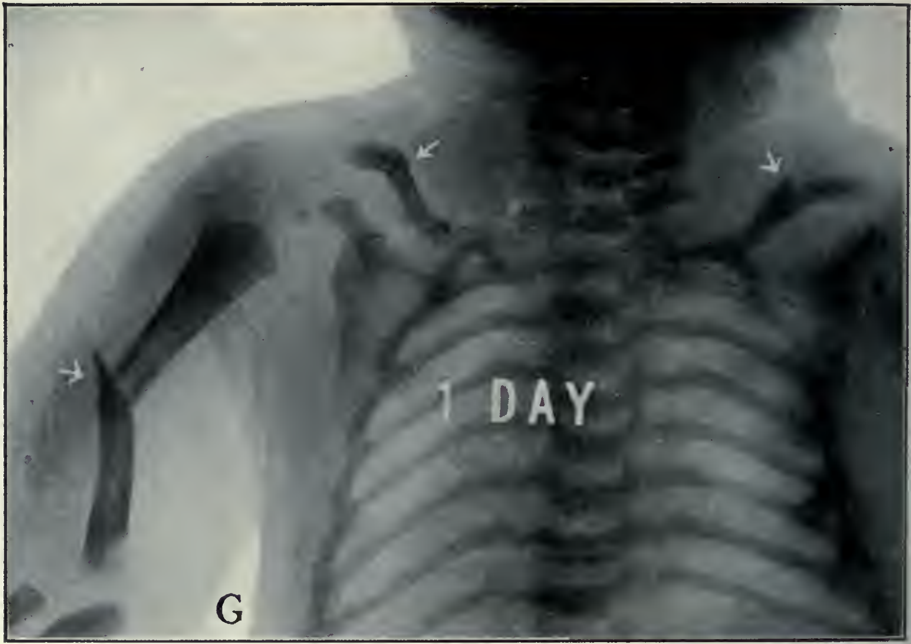

FIG. 6. CASE C. Fracture of humerus and both clavicles radiographed upon day of birth. The fracture of the humerus was situated at the center of the shaft, the usual site, but the line of fracture was oblique. Outward rotation of the lower fragment is noted, usually prevented by fixation of the forearm upon the front of the chest.

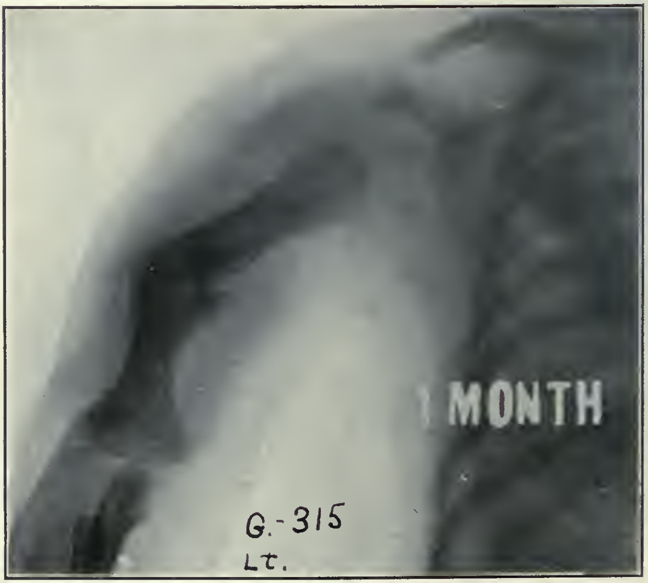

FIG. 7. CASE C. Repeated efforts to overcome the external angular deformity, which was excessive from the start, failed to secure union with the fragments in any sort of alignment. The radiograph at the fourth week shows union with extreme angular displacement.

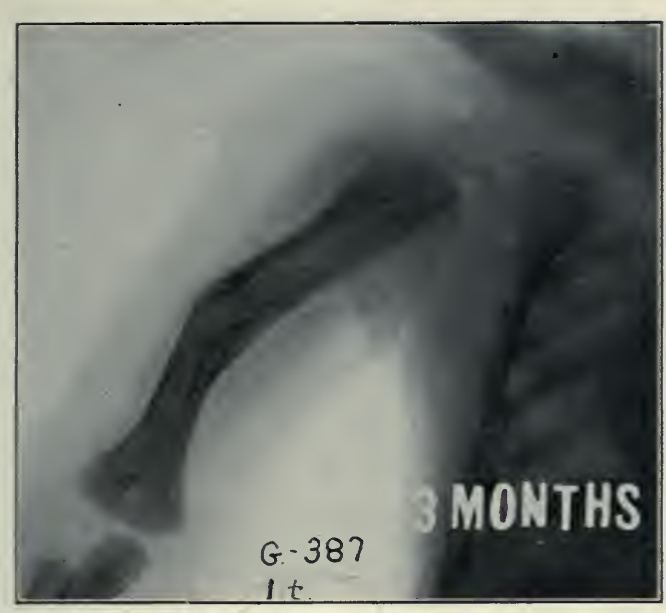

FIG. 8. CASE C. Two months later the deformity had been transformed from an angular displacement to an outward curvature. The restored medullary canal was already visible.

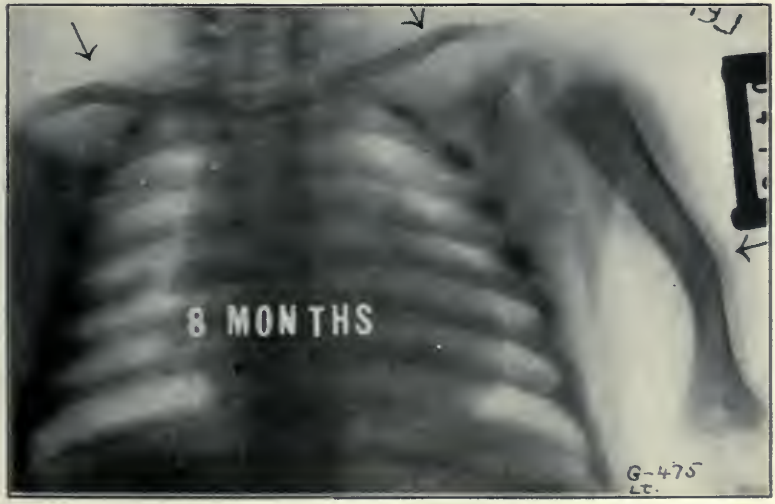

FIG. 9. CASE C. The radiograph at the end of the eighth month showed the satisfactory repair of the fractured clavicles, with some improvement in the deformity of the humerus. (Radiograph transposed.)

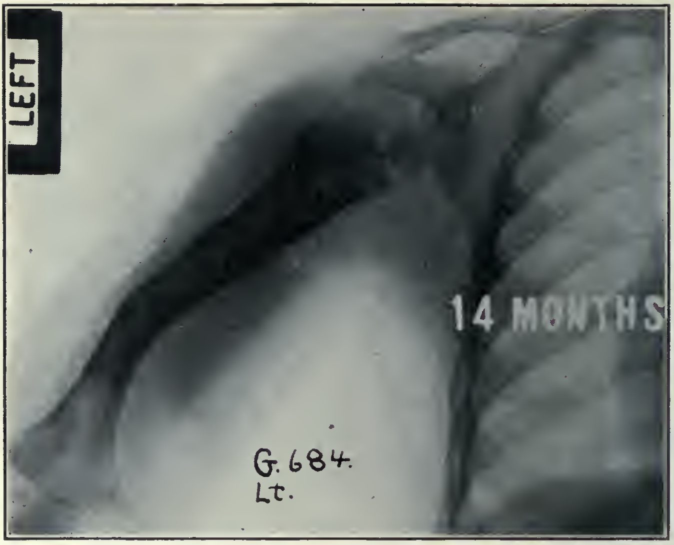

FIG. 10. CASE C. Continued elimination of the deformity is observed in the radiograph made when the child was fourteen months of age. The improvement is gradual but evidently constant, each successive picture proving nature's ability to deal successfully with these residual birth-fracture deformities.

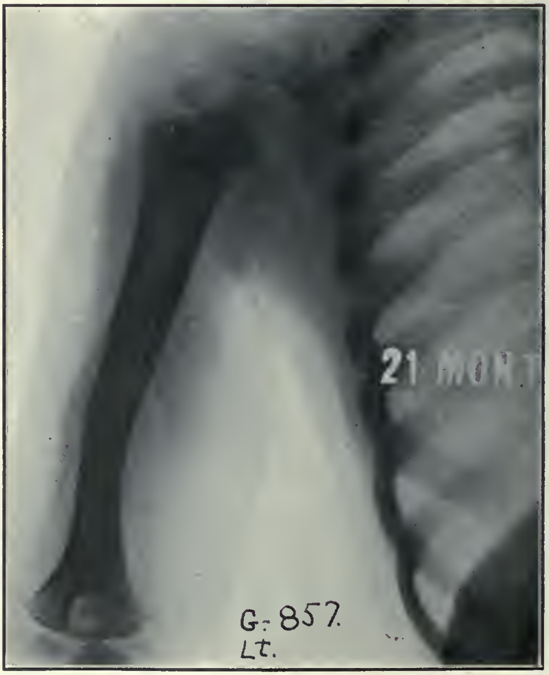

FIG. 11. CASE C. In twenty-one months nature had practically corrected the deformity in this case, the most extreme noted in any of the series under observation. The arm had developed normally; all functions of the arm were normal. There had been treatment after the first three weeks.

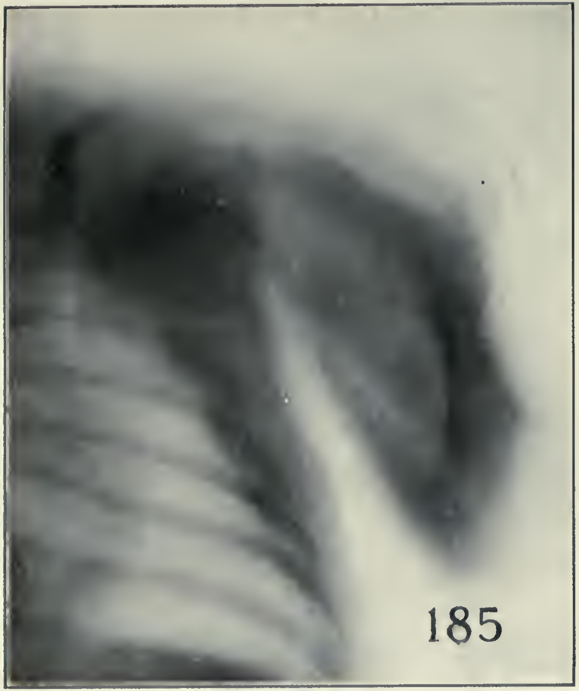

FIG. 12. CASE D. A third case of fracture of the humerus with angular deformity radiographed through the dressing at the end of the second week. Cases with the more marked deformities are shown for demonstration purposes.

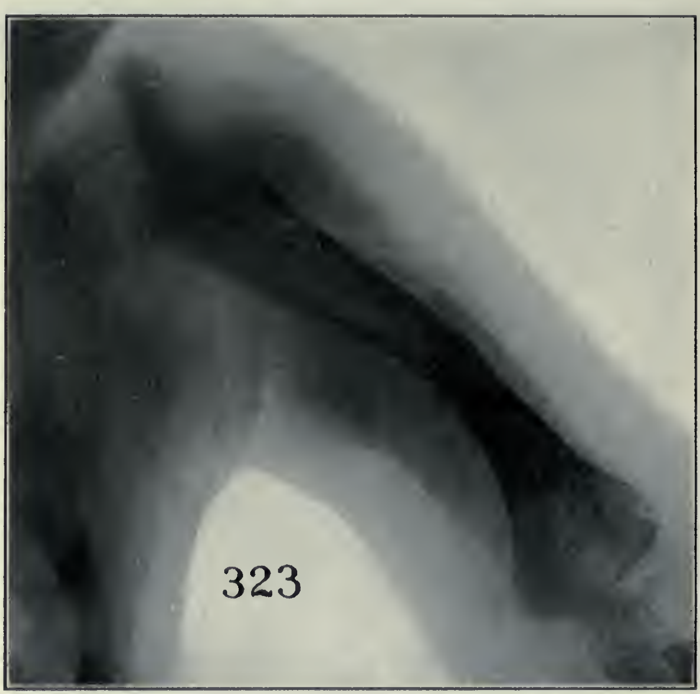

FIG. 13. CASE D. Radiograph seven months later, showing the curvature usual after the angular deformities of considerable degree.

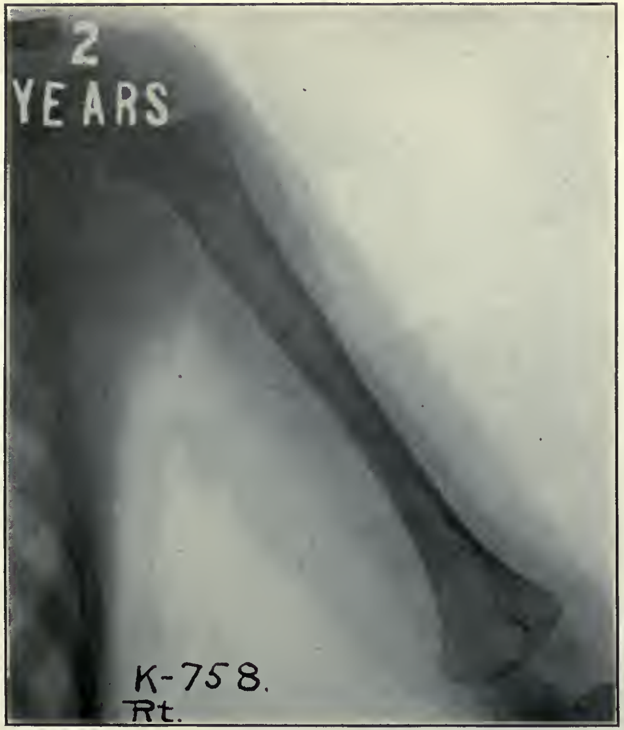

FIG. 14. CASE D. At the end of two years the humerus was found to be straight, indistinguishable from its fellow of the opposite side. In all cases the lesser degrees of deformity had disappeared in the first two years; in the extreme displacements, practically so in the same period.

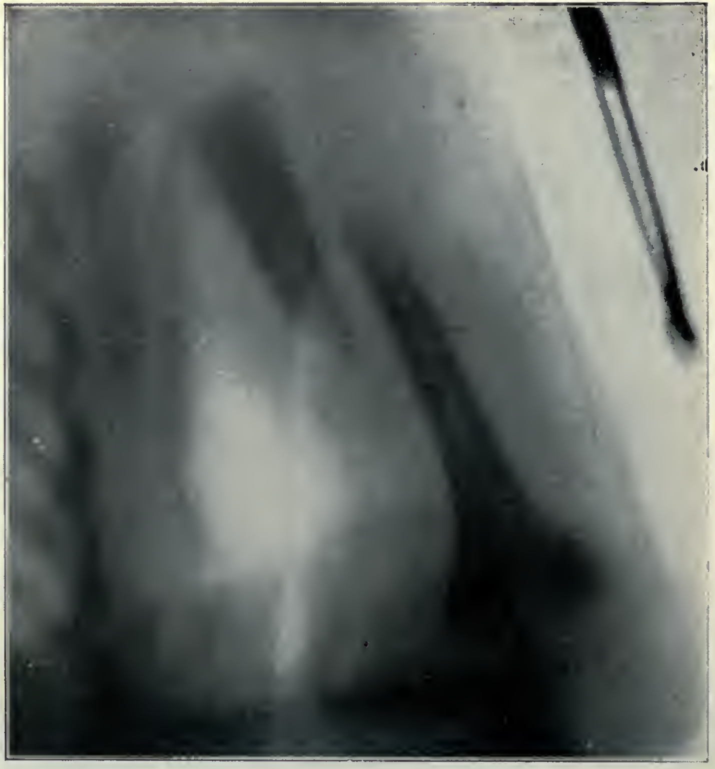

FIG. 15. CASE E. Birth-fracture of the humerus, showing the second and less common type of deformity, lateral displacement. Radiograph through the dressing at the eighth day.

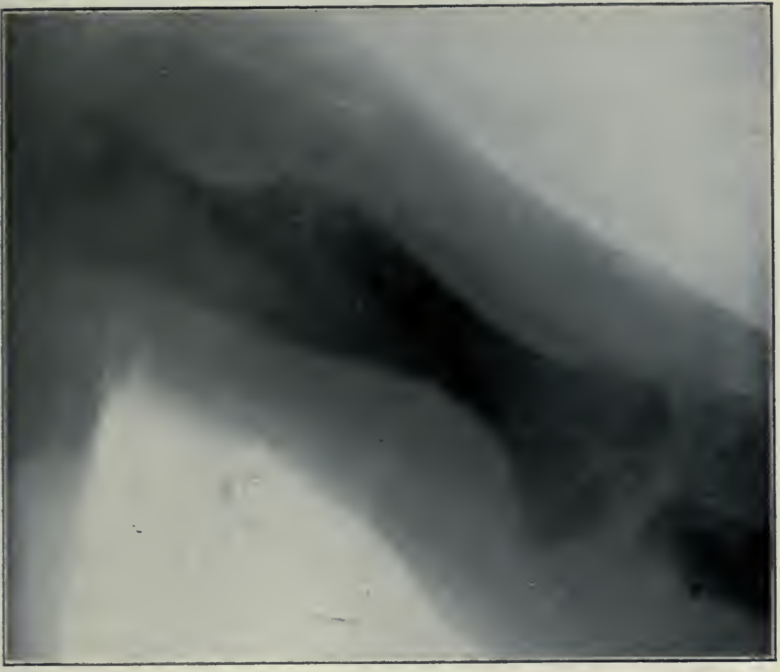

FIG. 16. CASE E. Radiograph at the second month, showing large interposed deposit of dense callus. The outline of the original fragments was still evident.

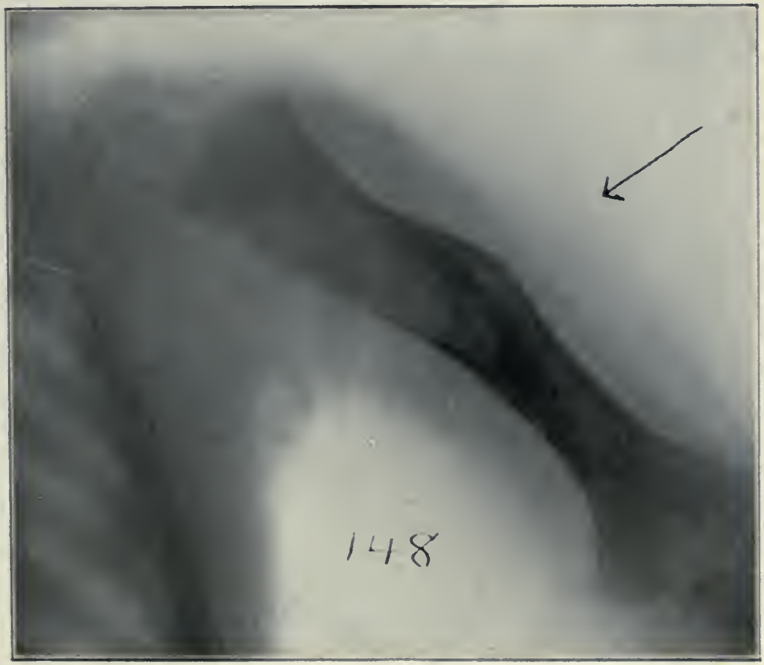

FIG. 17. CASE E. At four and a half months there was marked improvement in the deformity, superfluous bone had been absorbed, the lateral displacement was no longer evident the medullary canal was in process of restoration.

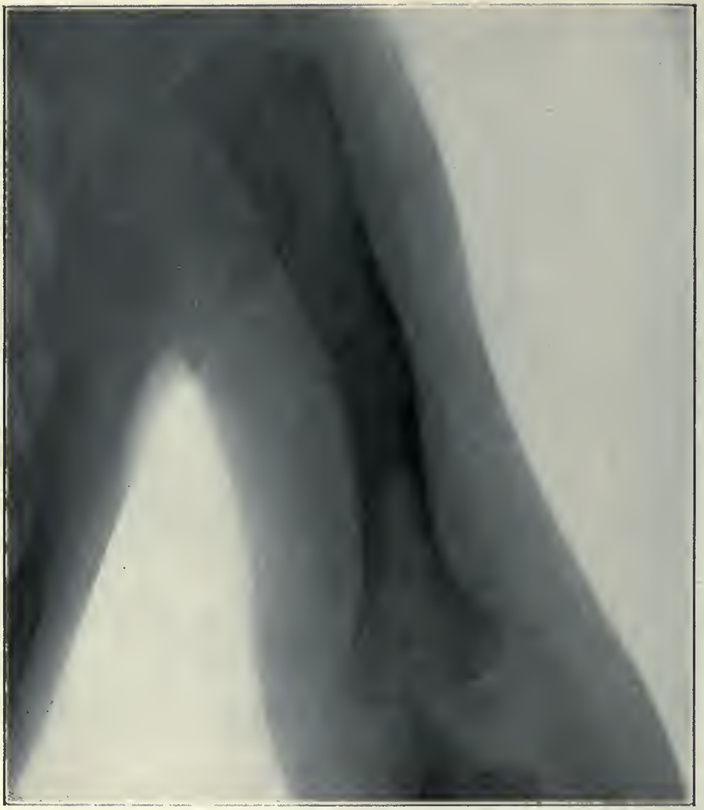

FIG. 18. CASE E. At fourteen months the injured humerus was found to have nearly straightened out. Comparison with the opposite side was favorable and all functions and measurements of the arm were normal.

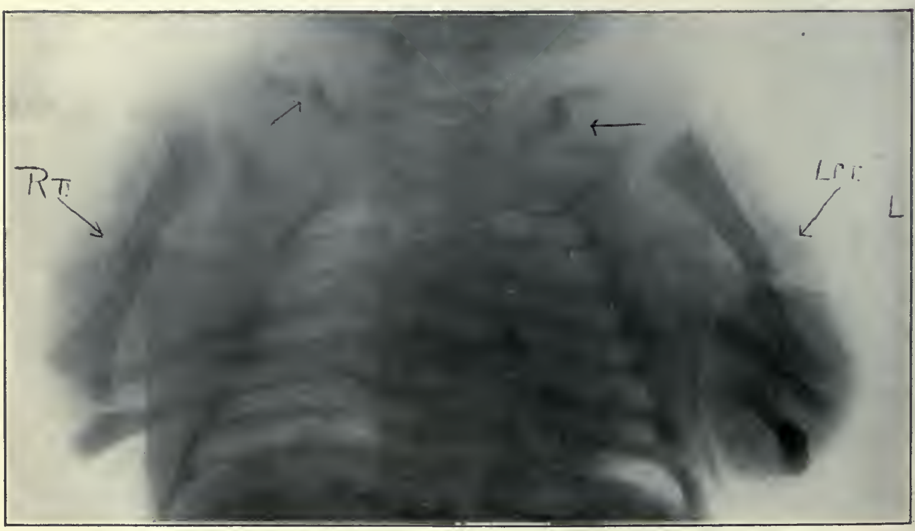

FIG. 19. CASE F. Radiograph, upon day of birth, of fractures of both clavicles and both humeri as a result of difficult breech extraction following version. Radiograph through dressing, which simply fixed the arms to the chest wall, the forearms being flexed behind the back.

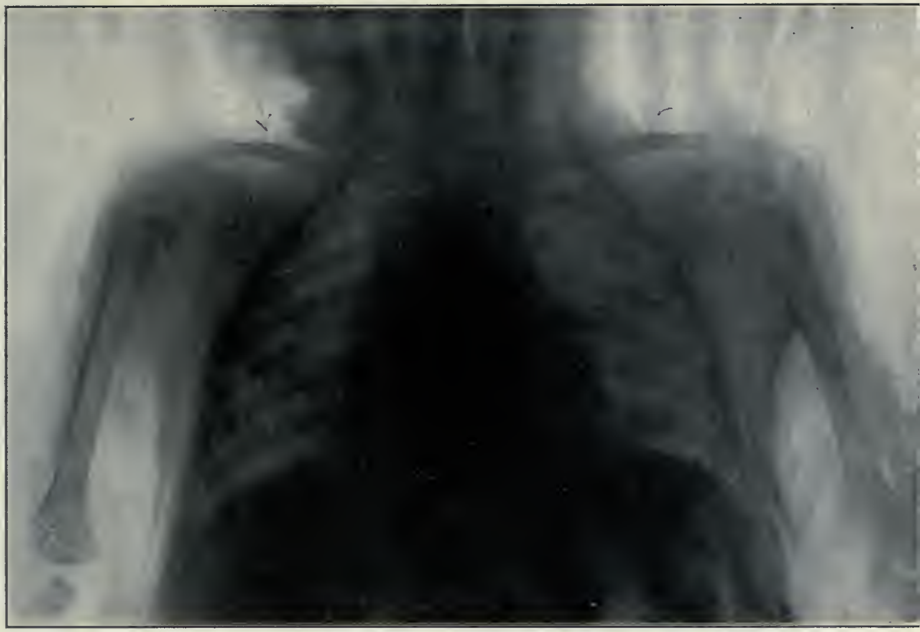

FIG. 20. CASE F. Same case eleven months later. The humeri were seen straight and equal; arm functions and measurements were normal. Clavicles, while not presenting an actual deformity, showed a "twisted" appearance at the sites of fractures.

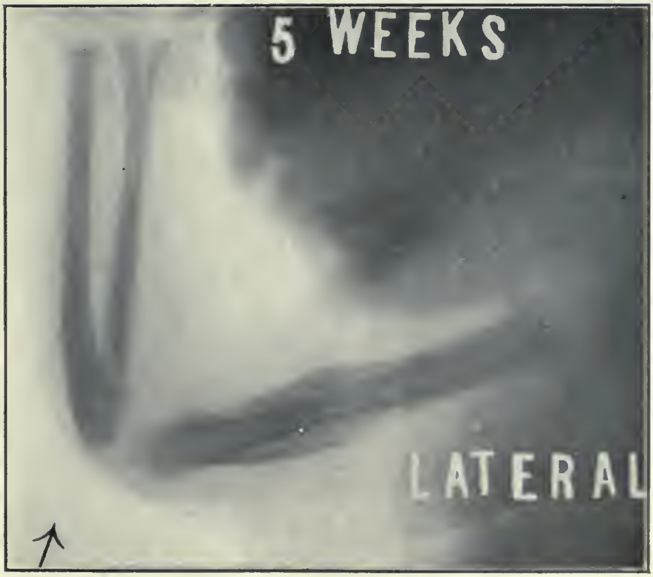

FIG. 21. CASE G. Lateral view of fractured humerus at the fifth week to show absence of anteroposterior deformity. The fragments were in alignment, the fusiform callus was well shown. In all cases of fractured humeri, radiographed from this aspect, no deformity has been found. All displacements observed in birth fractures of the humerus have been found to take place in a transverse plane.

A MODERN CHILDREN'S PAVILION (THE ABRAHAM JACOBI DIVISION FOR CHILDREN OF THE GERMAN HOSPITAL, NEW YORK)

BY A. L. GOODMAN, M.D.

Visiting Physician to the German Hospital, New York

The A. Jacobi Department for Children of the German Hospital is situated on the southwest corner of Seventy-seventh Street and Lexington Avenue, New York City. It was formerly the hospital for the private patients of the German Hospital. I mention this because we had to take into consideration the fact that we were dealing with the remodelling of the shell of an old building, and could not incorporate some of the ideas as we should have done had we been constructing an entirely new building.

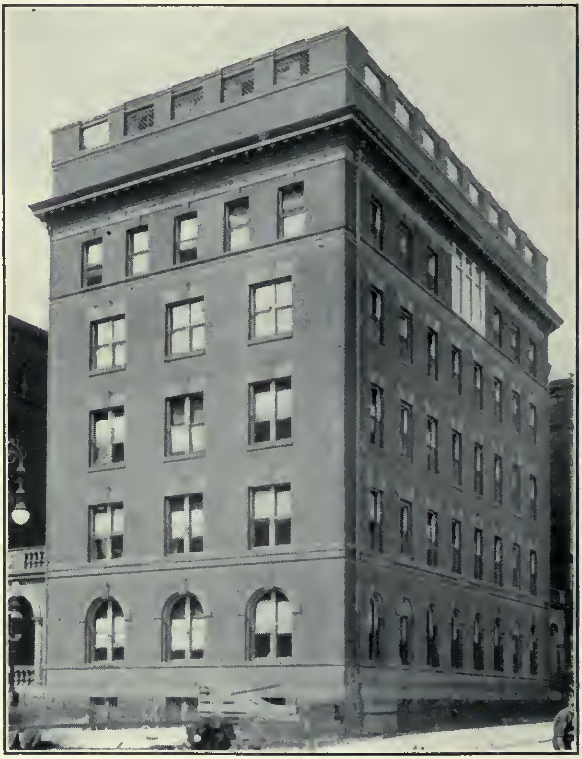

FIG. 1. The A. Jacobi Division for Children of the German Hospital, situated on the southwest corner of Seventy-seventh Street and Lexington Avenue, showing roof garden, also operating room on Seventy-seventh Street side.

To describe in detail the construction of the building will, I am sure, give but a poor impression of the appearance of the hospital. It must be seen to be appreciated, for I believe that it is about as perfect an institution for the care and treatment of infants and children as exists here or abroad.

The building is oblong in shape, with its axis pointing east and west in its entire length, and separated by a long corridor with the rooms on both sides.

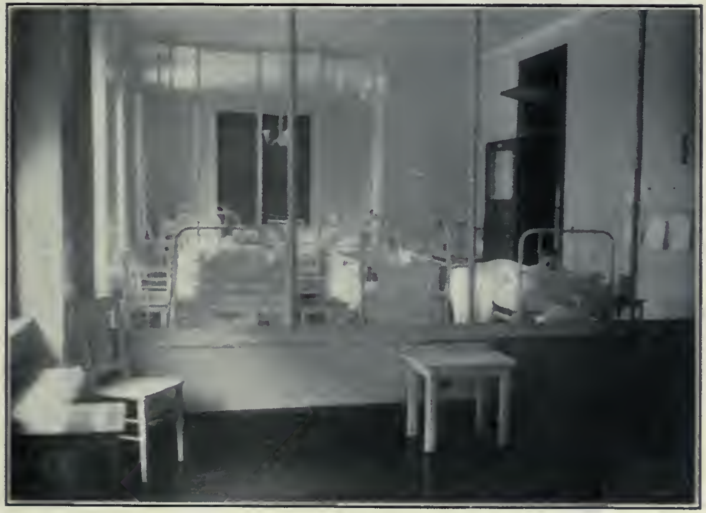

FIG. 2. One of the larger wards, each unit containing five beds, showing wall cabinets with history charts below, with running water in each unit. This picture also shows the ventilator at the ceiling.

The basement belongs to the administrative uses of the institution, and consists of a kitchen, scullery, stores, ante-room, dining-room for the chef and his assistants and bedrooms for their use.

Before discussing the medical features of the building I would like to state that in constructing an institution for the care of children we must bear in mind that it is our duty not only to treat the children placed under our care, but to protect them from infections within the hospital itself. With this end in view we have adopted a modified unit system throughout the institution, and have established, on the first floor, in conjunction with the administration rooms, a quarantine division.

From the plan of the first floor, you will see that the entrance to the building is on the side street. On entering the institution, to the left is the administration office and across the hall the waiting room; next, the doctors' room and the examination room for the admission of patients; then the nurses' room and pantry. The communication to this, the administrative section of the building, is separated from the quarantine and admission wards of the hospital by a glass door, so as to shut it off entirely from the outside passage and from inquisitive strangers. The quarantine division is again separated, as you will notice on the plan, by another glass door, which divides it into two units, consisting each of three separate rooms and bath; these rooms, as well as all other units in the building, are separated by plate-glass partitions, which enable the nurse in charge to have full view of the various units, which would be impossible had the walls been made of opaque material. This not only makes it easier for the nursing staff, but I believe it to be of great benefit to the children to see one another from one room to the next, witout possibility of contagion, to which they would be exposed in a larger ward. The next three rooms of this quarantine division are used for the general admission of patients. If any case is observed that gives the impression of a possible infectious dis-

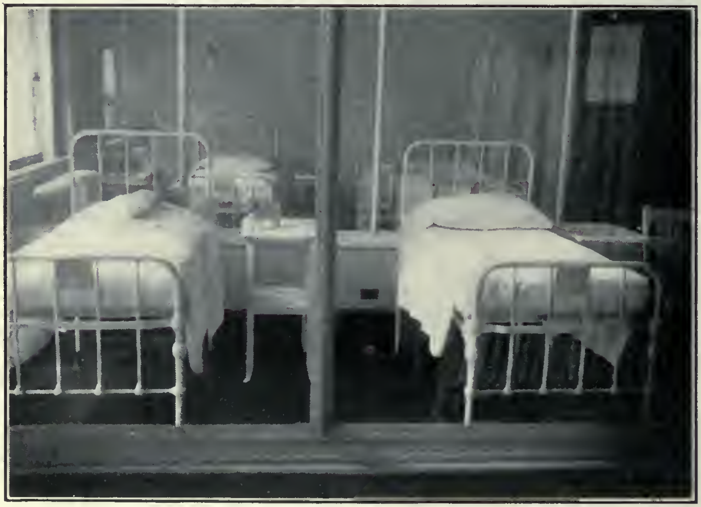

FIG. 3. Three-room deep isolation ward with two cribs in each unit, showing glass partitions separating each unit. Each crib has a number corresponding to wall cabinet.

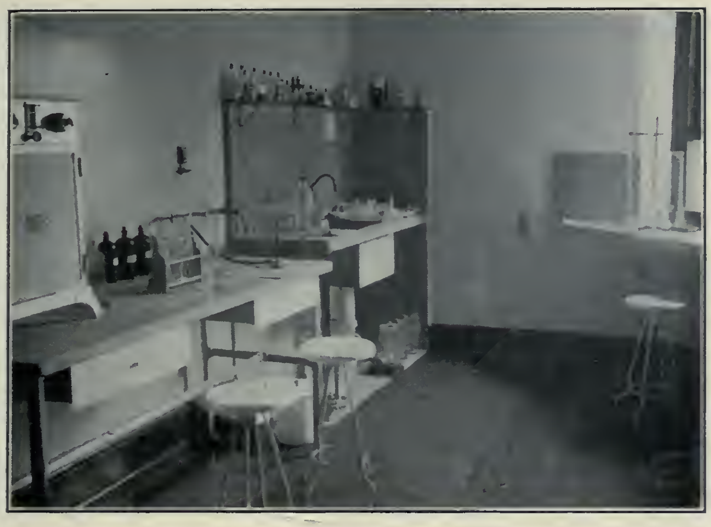

Fig. 4. Laboratory fully equipped with electric centrifuge, electric incubator and all apparatus necessary for clinical examination at the bedside.

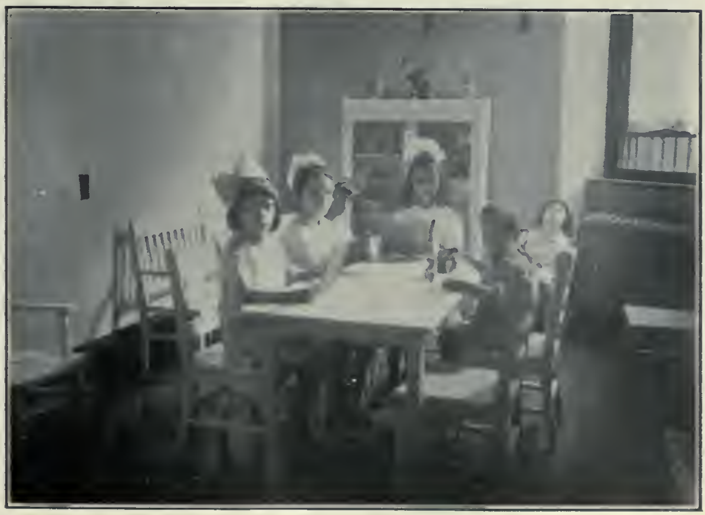

Fig. 5. Play room, one on each floor, where children well enough to be up are kept so as not to annoy the sick children in the wards.

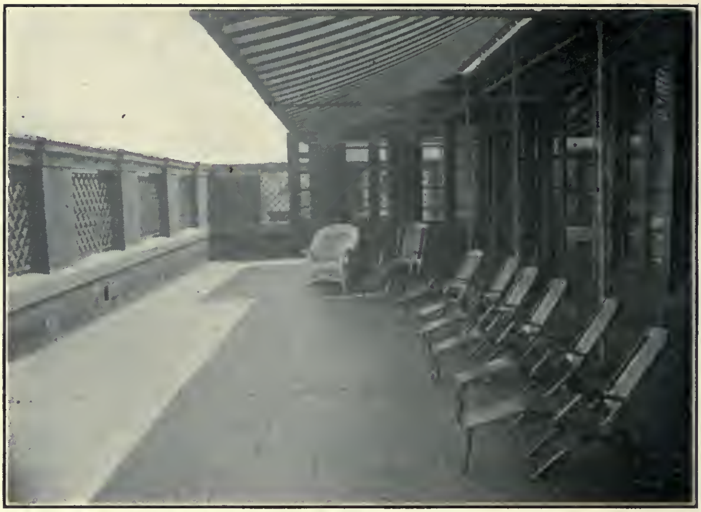

FIG. 6. Roof garden entire length of roof, showing enclosed hallway and enclosed room for open air treatment in inclement weather.

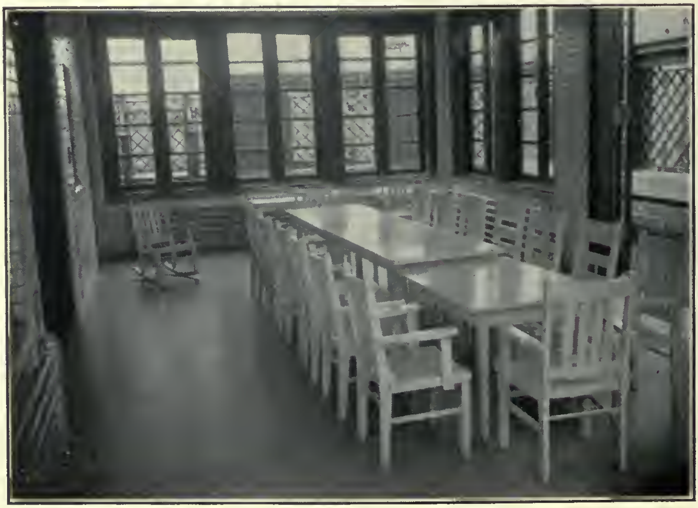

FIG. 7. Enclosed room at end of roof garden, showing open door and windows, giving exposure to all points of compass. Used at present as dining-room.

ease in its incipiency, it is at once removed to the other unit in the quarantine division, and kept there for further observation, infectious disease develop, it is at once transferred to the regular institution of the city, as no case of infectious disease is admitted or treated in our institution. All cases, medical or surgical, are kept in the general isolation wards for a period of from one to three days, during which time the routine examinations are completely isolated from the general admitting unit. Should any made, and when it is considered safe the child is transferred to one of the general wards on the upper floors.

The general wards are situated on the second and third floors, and consist, as you will notice on the plan, of four large rooms, each with wash-basin and bowel and running water, separated from the fifth room at the end of the oblong. This separate unit is a sound-proof room where noisy or delirious cases are sent and where contagious cases, such as typhoid, are placed, because of the adjoining toilet, which contains a separate compartment with steam sterilizer for the sterilization of bedpans, etc. In the walls in each room, which are indicated on the plan in little white subdivisions, are 12 x 12 inch compartments; each of these has a glass shell at the height of 6 inches and is closed by a metal door; these contain all the necessary articles used by each child, such as cup, toothbrush, thermometer, pus-basin, wash-basin, etc.; these compartments are numbered and correspond to the number fastened to the foot of each bed in each room. Besides these wall cappings, in each bath-room there is a rack with a corresponding number on which are hung the towels, wash cloths, etc., so that no child during its stay in the hospital ever uses any article but its own. In the bathrooms there are also small toilets and bowls for those children well enough to be about; these are separated entirely from the toilets for the nurses' use. Each crib in the institution has a movable mattress and spring, which may be raised to the upper level of the stationary sides, so that in making rounds it is not necessary to lean down or over the patient, but the child is brought up to the level of the stationary side.

If you will look at the plans of the second and third floors you will notice that, by means of the glass partitions which separate the three large rooms, as stated before, the nurse, situated at any part of this floor, has an unobstructed view of all three units.

Since the opening of the division I have had ample opportunity to confirm what I have previously stated, that these glass partitions also enable the children to see one another and enjoy each other's company to a certain extent, although not in the same room.

The second and third floors have each a play room located at the extreme end of the hall, where those children well enough to be up are kept out of the general ward, so that they may not annoy those who are too ill to be about or who must be kept quiet. No child is permitted to play or walk in the rooms or corridors.

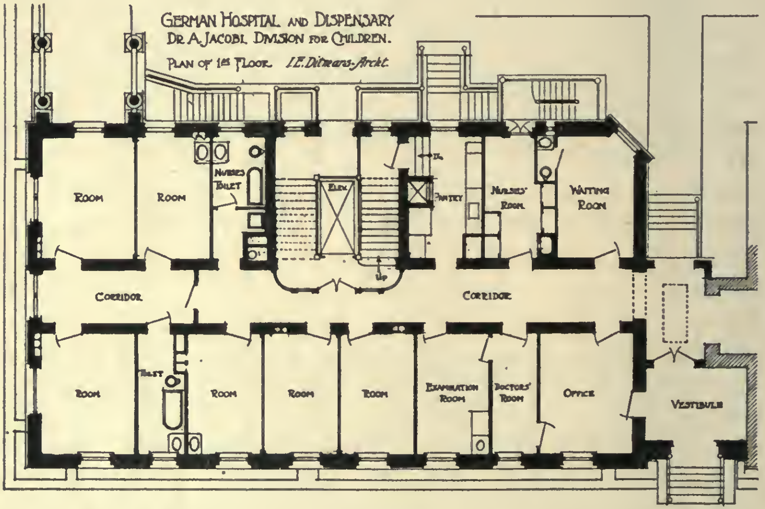

FIG. 8. Plan of First Floor. German Hospital, A. Jacobi Division for Children.

Each bed has over a thousand cubic feet of air, which is more than that required by the State Board of Health. In all the ward units there are base plugs for the use of electric apparatus, which make it possible to bring the necessary instruments to the bedside, so doing away with the necessity of moving the child to the instrument. In the pantry on each floor is a large, white-enameled, stationary icebox, equipped with an air cooling apparatus, with proper provision for the reception of milk and other articles. Next to this icebox is a smaller box, or compartment, for the reception of cracked ice, to be used in ice bags, etc. There is also a dumbwaiter shaft with a dial showing at what floor the dumbwaiter is to be found. This dial obviates the necessity of putting the head in the shaft to locate the dumbwaiter, which has often been the cause of serious accidents. We have also equipped the hospital with a clothes chute lined with white enamel, which extends from the roof to the cellar; arrangements have been made in the cellar, where the chute ends, for flushing it. This clothes chute does away with the annoyance of having the soiled linen, etc., carried from one floor to another or on the elevator.

The fourth floor of the building is to be used for private rooms, where parents may bring their children and stay with them if they so desire. On this floor there is also a fully-equipped laboratory, where all the clinical examinations are made.

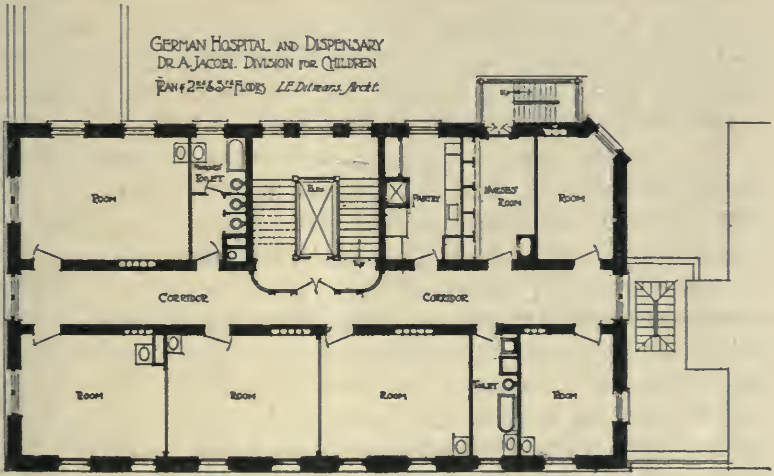
German Hospital and Dispensary
Dr. A. Jacobi. Division for Children
Plan of 2nd & 3rd Floors L.E. Ditmars Arch't.
Room
Toilet
Elev.
Pantry
Nurses Room
Room
Room
Corridor
Corridor
Room
Room
Room
Toilet
Room

FIG. 9. Plan of Second and Third Floors. German Hospital, A. Jacobi Division for Children

The fifth floor consists of an operating room and the nurses' quarters.

Between the fifth floor and the roof-garden is a sort of mezzanine floor, in which are kept the clothes of children in the hospital. These clothes are first sterilized and then placed in compartments in the storerooms.

On the top of the building we have placed a large roof-garden covering its entire area. It has two spacious sun-parlors with exposures to all four points of the compass and is entirely surrounded with glass windows, a large glass door opening out on to the roof proper. The roof has a large stone coping with iron latticework, and is so constructed that the children cannot climb up or on it, no matter how agile they may be. The sun-parlors will be used as play rooms or treatment units, as the necessity arises. The roof-garden is equipped with nurses' quarters, medicine chest, toilets, etc., and also has a service room with icebox, dumbwaiter and clothes chute, as the lower floors have, so that if it becomes necessary in the summer time or at any other time of the year to keep the children on this floor, it can be utilized just the same as the other working units of the hospital.

I would like to call attention to the floor plans, showing the elevator and stairs enclosed from the rest of the building by glass door partitions, cutting them off from the hospital proper.

There is a large, roomy fire-escape extending from the roof to the ground floor; access to it is through the pantry on each floor, the doors having a patent bar lock which can be pushed open with the slightest touch of the finger.

The hospital equipment (beds, tables and furniture of all kinds) is finished, wherever possible, in white enamel. The walls of the building are painted with oil paint in a shade of French gray, and the floors are made of hard wood.

The visiting days in the hospital are Wednesday and Sunday afternoons from 2 to 4 P.M. Each child is allowed two visitors, this privilege usually being restricted to the parents. No juvenile visitors are admitted to the institution. Every person entering the hospital, whether a physician in charge or a visitor, must wear a gown furnished by the institution during his or her stay. No food is allowed to be brought in by visitors.

The hospital has fourteen beds in the quarantine division, twenty-two beds each on the second and third floors and provision for the accommodation of eight private patients.

It is our intention, if we can secure the funds, to establish a well equipped social service department in conjunction with the institution, and to provide convalescent children with a modified kindergarten instruction.

There has already been established in conjunction with Columbia University a course of bedside instruction in pediatrics.

In the course of time we hope to be able to establish a department for trained infants' nurses and for post-graduate instruction in pediatrics for both the doctors and nurses.

Trusting to our earnest endeavors and the active coöperation of the public in general and our friends in particular, we hope for the speedy realization of the aims we have in view.

SOCIETY REPORT

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS

Stated Meeting, Held May 13, 1915

WALTER LESTER CARR, M.D., CHAIRMAN

PROPHYLACTIC VACCINATION FOR VARICELLA

DR. SOPHIE RABINOFF in this paper reported her experience with prophylactic vaccination during an epidemic of varicella in the wards of the Hebrew Infant Asylum of New York City. (See p. 651.)

DR. ALFRED F. HESS said that he could merely reiterate what Dr. Rabinoff had said. Her results spoke for themselves. The decided difference in the number of children that contracted varicella among those that were vaccinated and those that were unvaccinated was proof that vaccination did provide some protection. Where two or more children in the same family had been exposed at the same time it was questionable whether vaccination would be of much practical value, since it seemed that vaccination during the incubation period of the disease was not very effective. Where, however, one child of a family was exposed and came down with the disease, prophylactic vaccination would be of great advantage to the others. Although varicella was not a serious disease, it caused great inconvenience both in the home and in institutions due to the long period of quarantine which it necessitated. These vaccinations had been necessarily discontinued at the asylum at present, due to the cessation of the epidemic. However, Dr. Hess said he purposed to make use of this therapy again on his service should chicken-pox make its appearance at some subsequent time.

DR. WILLIAM H. PARK said he wondered if Dr. Rabinoff knew how long the virus could be preserved at a low temperature and whether it could be preserved at freezing temperature for long periods, as vaccine virus, and also whether she had been able to obtain enough to use for purposes of propagation. A third point that he would like to know about was whether she had observed whether the virus was more abundant in the epithelium at the base of the vesicles than in the fluid contents.

Dr. Sophie Rabinoff, in closing the discussion, said that she could not say how long the vaccine would keep, since they had been able to obtain so little and had been using that immediately for prophylactic purposes. In most of the cases they had been using the virus from the vesicles directly.

With reference to the propagation, Dr. Rabinoff said she had nothing to report, but Dr. Kling reported having propagated it successfully through six generations, using material from one vaccinated case to another. She had not tried scraping the vesicles, as Dr. Park suggested; there was so little serum in them that they had just taken what they could get.

THE USE OF SENSITIZED GONOCOCCUS VACCINE IN GONORRHEAL VAGINITIS

Dr. Russell L. Cecil stated that a sensitized vaccine differed from other vaccines in that it had been treated with a specific homologous serum. The sensitized vaccine was less toxic than the non-sensitized and also gave a higher degree of immunity. The sensitized vaccines were first used by Besredka in experimenting with typhoid and cholera. Metchnikoff showed that apes were not only protected, but that they were cured by the use of sensitized typhoid vaccines. They had now been used in many infectious conditions.

French writers had been very enthusiastic about the use of sensitized gonococcus vaccine, especially in arthritis and orchitis, but comparatively little had been written about the sensitized vaccines in gonorrheal vaginitis.

The series presented showed only 12 cases. These were, of course, too few to warrant one in coming to any direct conclusions as to the value of the treatment, especially since all the cases received local treatment at the time. All of the patients in this series were under twenty-five years of age. There were 2 cases complicated by salpingitis and 2 by arthritis.

The duration of the disease before the treatment was started was a factor of some importance. A few had been treated locally before they had seen a bacteriologist. It was much more difficult to get results in cases of long standing. Two to sixteen inoculations were given at intervals of from five to eight days. He had been accustomed to start with a dose of 100,000,000, but he had used doses as high as 2,000,000,000,000 in the course of the treatment.

In most of the cases there was a sharp local reaction, but in only 1 was there a marked constitutional reaction. The severe reaction usually came on after the first dose of the vaccine had been given. The reaction was not different from other vaccine reactions in severity.

As to the results—as stated before—nearly all of these patients had received local treatment, irrigations of potassium permanganate daily and silver nitrate distentions once a week. It scarcely seemed fair to rely entirely on the vaccines and not to give the patients the benefit of local treatment. The results had been satisfactory in all but 3 cases. One of these was still under treatment and the other 2 patients were frail and poorly nourished. They had very severe reactions and never developed any resistance to the vaccines.

It was very difficult to express any definite opinion on this series of cases and he had simply presented them so that the members of the Section might draw their own conclusions. The cases that were seen early responded more quickly to the vaccines than those seen after the infection had existed for some time. It should be remembered that the gonococcus sometimes disappeared long before the patient was cured, and hence treatment should not be abandoned too soon.

Dr. William H. Park stated that they had never used sensitized vaccines, owing to the fact that in their early work they found that agglutination did not develop so well as from the non-sensitized vaccines. But it had developed since that they had been mistaken in giving up this method, for the reason that it had been shown that other antibodies developed. If sensitized vaccines were giving better results than the non-sensitized it was probably because they could be given in larger doses without any deleterious reaction.

Dr. Park said he had understood Dr. Cecil to say that in their cases they had succeeded not only in controlling the symptoms, but in getting rid of the organisms and that was certainly somewhat better than they had done at the Willard Parker Hospital.

Dr. R. Ottenberg said he had no experience with sensitized vaccines. He had at first been skeptical as to their value, probably because of the well-known experiments in the production of antibodies against red cells sensitized with hemolytic antibodies. In these experiments few or no antibodies could be produced by such injections after the red cells were completely sensitized; nevertheless, immunity against infection and the immunity reactions which could be demonstrated in the test tube were not necessarily parallel, and the question as to whether immunity to infectious agents could be developed by sensitized vaccines was one which would have to be settled chiefly by such clinical observations as those of Dr. Cecil.

Dr. A. L. Garbat said that Dr. Park had brought out that the sensitized vaccine did not seem to produce antibodies. In his experiments made in association with Dr. Meyer on typhoid, he showed that no agglutinins and bacteriolysins were obtained with the sensitized vaccines as they were with the non-sensitized, but they did get a bacteriotropic serum and also one that could protect and cure mice against ingestions of ordinary bacteria. Dr. Cecil evidently belonged to that class who believed in large doses of vaccines. He himself had been brought up on Dr. Wright's principles that nothing was gained by too large doses. The small doses produced a rise in the opsonins.

As to Dr. Cecil's results, there were several points open to discussion. Dr. Cecil did not say what type of gonococcus he had used, nor did he state whether he had used a polyvalent vaccine. He did not say whether he had used a vaccine made from the infantile type of organism, as it was recently shown that the adult and infantile types of gonococci differed greatly in their antibodies.

Dr. Royal Storrs Haynes asked Dr. Cecil how long he had followed these patients to see whether there were any relapses. This was important, since these cases were so prone to relapse.

Dr. J. S. Ferguson said he had not used the sensitized vaccine, but he had used the non-sensitized in more than 500 cases and he had obtained a definite improvement after two or three injections. He has also obtained more striking results in the acute than in the chronic cases. The profuse discharge changed to a very slight one quite regularly after three or four injections. In chronic cases, in which there was an indefinite discharge, one did not seem to get the same striking results. Dr. Ferguson asked Dr. Cecil if he had observed whether after using sensitized vaccines there was a fairly definite period in which one might look to see a reduction in the amount of discharge. It seemed to him that the length of time the disease had existed was a very important item, especially in children. He recalled a case of a child twelve years of age who had had various attacks of enuresis at various intervals since early life. The last one was accompanied by slight discharge and the gonococcus was found in the smears. It seemed probable that the attacks of enuresis had a relation to the bacterial finding. One could not draw definite conclusions, but it seemed to him that one did not get as good results in the cases of long standing as in those that were recent. It was also difficult to determine in such cases when a cure had been accomplished.

Dr. Fenton B. Turck said that he was interested in this presentation, more particularly because it was so conservative and because it called their attention to the necessity of making further investigations in reference to the action of sensitized bacteria.

Dr. Turck recalled an interesting case of a young girl who was supposed to be suffering from tuberculosis. She had lost weight, had a hectic flush, and an elevation of temperature for some months. Under the care of a physician she had been taking the out-door anti-tuberculosis treatment in England. On arriving in this country she had consulted Dr. Turck. An X-ray examination showed a glandular enlargement, but the diagnosis with reference to the tuberculosis was not confirmed. Passing the stomach tube and examining the resulting specimen he had found the colon and pyocyaneus bacilli in symbiosis. An examination of the feces gave the same results from the lower bowel. He administered sensitized vaccines, 150,000,000; then waited five days and administered a second dose. This was followed by an anaphylactic reaction and after this the patient had no further symptoms. She now reported that she had been well for a year. This was an instance in which the result was absolutely due to the vaccines without any other treatment. In other cases he had had good results and thought that the sensitized vaccines promised to be an effective therapeutic agent.

Dr. Cecil, in closing the discussion, said that Louise Pearce had shown that gonococci isolated from infants were different from those taken from adults, both in agglutination and in complement fixation reactions. He had prepared his vaccines from the Board of Health cultures of gonococci, and his serum was from animals immunized against these organisms. The labor of making autogenous vaccine was great, since it was necessary to immunize animals in order to get the sensitizing serum.

Dr. Cecil said it had been impossible to follow up all the cases after they were discharged, and he had assumed that they were doing well, as they had not returned to him.

As to the time when these cases were treated, one got better results when the cases were treated early. Of course, in those cases in which there was a profuse discharge the improvement was more readily observed than in cases with a slight discharge.

BACTERIA-FREE VACCINE

Dr. Hideyo Noguchi stated that the ideal vaccine should possess sufficient potency to insure a successful vaccination in cases in which there was no immunity and at the same time be free from secondary bacterial contamination. The prevailing method of vaccine preparation at present consisted in the collection at an appropriate moment of the virus from the vaccine eruptions on the skin of the calf and then subjecting the raw material to the bactericidal effects of certain chemical reagents (glycerin, phenol, etc.), which did not impair the virus itself to any serious extent. By this treatment the contaminating bacteria were so reduced in number and kind that the material was now considered ripe for practical use. The method required stringent precautions in order to produce a model vaccine, and no product was regarded as ready for use before it had been left in contact with the chemical (glycerin) for a month or longer. It was evident that much labor and care could be spared if a method was found by means of which the virus could be propagated directly free from bacterial contamination.

The essayist said his attention had been engaged with this problem for the past year and he had now succeeded in propagating pure vaccine in the testicles of the rabbit and calf which was absolutely free of bacteria and preserved its virulence undiminished.

The testicle of the rabbit had been employed in recent years for the cultivation of spirochetæ, the Treponema pallidum and Treponemapertenue; and the effects upon the organ of the inoculation of the usual vaccine virus had been studied slightly. However, the few experiments performed did not have in view the preparation of pure vaccine for practical use in vaccination.

The essential first step was to have for inoculation into the testicle a vaccine virus quite free of bacteria. This was secured by inoculating the carefully cleansed and shaved skin of a rabbit with glycerinated virus, protecting the vaccinated surface with sterile gauze, collecting the skin vaccine at the height of the eruption, the spores and spore-bearing bacteria having thus been excluded, emulsifying it in sterile salt solution and treating the emulsion with pure ether or with phenol in appropriate concentration. Non-spore-bearing material might thus be killed without seriously impairing the strength of the virus. Vaccine virus containing bacteria was unsuitable for testicular inoculation, since the inflammation which ensued favored the growth of the bacteria at the expense of the virus.

On the other hand, when the virus devoid of bacteria was inoculated into the testicle it multiplied very much, as it did in the skin, so that on the fifth or sixth day maximal growth had been obtained after which, as the immunity rose, the multiplication fell off and, ultimately, the virus disappeared. Hence the testicles were removed at the proper moment and employed, in part, for reinoculation.

But not every strain of vaccine virus could be transmitted to the testicles, and also several successive testicular inoculations were required in order to adapt even a favorable strain to the testicular growth. Once adapted, the propagation in the testicle seemed to proceed as regularly as in the skin.

When the virus had been adapted to the testicle of the rabbit it could next be adapted to the testicle of young bulls. Several successive inoculations were required in this latter animal, also, in order to obtain a virus of high activity.

The testicular cultures of vaccine virus exhibited all the characteristic properties of the skin-propagated virus. The two varieties of virus were indeed indistinguishable in their action upon the skin and cornea of rabbits and the skin of calves. Moreover, the rabbit testicular strain of the virus, free from all bacteria, produced typical vaccinal effects in human subjects in whom were eliminated the secondary local and general reactions due to bacterial association with the skin virus.

Dr. Noguchi stated that a paper dealing with this subject in full would appear in the June number of the Journal of Experimental Medicine.

Dr. Frank Sidney Fielder said he had had the pleasure of seeing the pictures and specimens of testicles and regretted that they could not be shown on the screen. Dr. Noguchi had also permitted him to read the advance sheets of his paper on this subject, which was to come out later, so that he was familiar with the work that Dr. Noguchi had done and it fulfilled all the requirements of vaccine. It was identical with the standard glycerinized vaccine both in ordinary strength and in the various dilutions. It was naturally a desideratum to have a bacteria-free vaccine. However, they knew that they now had a vaccine produced in a standard manner and one that contained no pathogenic organisms. The authorities at Washington imposed a series of regulation tests which had to be employed by all those manufacturing vaccine from the skin of the calf.

It was formerly thought that a vaccine must be fresh, but they had learned that this was no longer desirable. They now got the green vaccine and mixed it with 50 per cent. glycerin and 1 per cent. carbolic. This was then plated and would grow some organisms, which, as a rule, were not pathogenic. They tested it out by plating it once a week on agar for five weeks. Usually after two or three weeks there was no growth on agar. They also plated it on agar and also tested the vaccine for gas-forming organisms on glucose broth. It was also carefully tested for tetanus, but they had not found it. The Hygienic Laboratory at Washington had also tested samples from other laboratories, but in thousands of specimens examined had found none. It might be stated that as now produced standard vaccine was practically free from bacteria.

It might be stated that in their own laboratory Dr. Williams more than ten years ago succeeded in producing a bacteria-free vaccine on the skin of rabbits, but it had not been possible to propagate vaccine absolutely bacteria-free on the skin of the calf.

As to whether a bacteria-free vaccine could be thus produced in the testicles of rabbits or bulls so that it would become a practical method the future would have to decide. The idea of propagating a virus in such an absolutely sterile way was appealing, and he looked forward to trying it out to see whether it could be produced on a large scale. In a few cases it had been employed on human beings and Dr. Noguchi had employed it on human beings, as they did the standard vaccine. It remained to be proven whether it would produce 100 per cent. of successful primary vaccinations, which it must do to be practical. That it should not have done this thus far was not necessarily against the method and such a percentage might be obtained later. Another question was whether this bacteria-free vaccine would keep as long as the standard vaccine from the calf. Again it would have to be proven whether when human beings became immunized with testicular vaccine and the immunity lasted as long a time as with the standard vaccine. The method would have to be tested out and in time it might be substituted for the vaccine from the calf.

Dr. Park said that he wished to speak of the harmlessness of the few bacteria in the standard vaccine. Until within a few years no consideration was given to the bacteria. It was demanded that the appearances of the vaccination in the calf should seem to be correct. Now they were trying to eliminate the bacteria. In order to prevent the increase in virulence of any bacteria in the calf the virus was passed from the child to the rabbit and from the rabbit to the calf. The bacteria from the calf's skin had never been shown to do harm.

Dr. Park asked Dr. Fielder whether vaccine from the rabbit was as permanent in its viability as that from the calf.

Dr. Fielder said they had some vaccine two years old from rabbits which they were using to vaccinate calves.

Dr. Park said that even leaving out the value of excluding the bacteria, the using of the rabbit would be an advantage in localities where they could not get calves.

Dr. Alfred F. Hess said he had been using these vaccines. He had employed them on 24 children and was glad to have this opportunity of speaking of his experience. He first vaccinated a series of 12 children under one year of age and there were 10 good takes. There were 2 that did not take. In the 10 that took the local reaction was quite marked, almost as much so as with the standard vaccine, but the systemic reaction was much less marked. The temperature never exceeded 100°F. He then vaccinated another series of 12 children. In 1 of these the vaccination did not take, but in 11 there was a marked local reaction and no systemic reaction. So out of the 24 children 3 of the vaccinations did not take, but in all the others there was a marked local reaction, first a marked vesicle and then a pustular formation, together with a lack of systemic reaction. The 2 children in whom the vaccination did not take were vaccinated a second time, but it did not take again. So from this small experience it might be said that this bacteria-free vaccine had the advantage of giving a slight systemic reaction, but that possibly it was not as strong as that usually employed. Even if it did not take as often as glycerinated vaccine, still for private patients and for vaccinating infants it had a decided advantage on account of the lack of systemic reaction. There was another question, namely, whether the systemic reaction might be due to bacteria, and whether this lessened systemic reaction was due to the absence of bacteria.

Dr. Noguchi, in closing the discussion, said he wished to say a word regarding Dr. Park's apprehension that in utilizing the rabbit material for practical purposes some organisms pathogenic for human beings might possibly be introduced into the organism. Such a possibility seemed rather remote with the method advocated in this paper, since so far as was known there did not exist any epizootia in the rabbit that was communicable to human beings. Compared with the calf there was a much greater possibility of avoiding such an occurrence by the use of the rabbit, since the calf was known to be susceptible to tuberculosis and foot-and-mouth disease, both of which were communicable to man. The advantage in this respect rested with the rabbit and not with the calf. At the same time, as stated in the paper, they might use bulls instead of rabbits. As to the protective value of the testicular bacteria-free vaccine against variola, it was fully equal to that produced by the regular skin virus, as they had found that both afforded the same amount of protection in animal experiments. It would be advisable, however, to follow the suggestion of Dr. Fielder that a trial be made in a series of cases to determine whether or not persons who were first vaccinated with bacteria-free testicular vaccine were subsequently equally refractory to inoculation with the ordinary standard vaccine as were those who were previously vaccinated with the latter under identical conditions. Dr. Hess reported 3 failures in 25 vaccinations; this could be easily remedied by using slightly stronger concentrations.

EXPERIENCES WITH VACCINES AT THE MASSACHUSETTS GENERAL HOSPITAL

DR. ALBERT E. STEELE, of Boston, presented this paper by invitation. He stated that the treatment of various infections by means of vaccines was started at the Massachusetts General Hospital in 1907, and since that time a clinic had been open daily.

The use of vaccines might be divided into prophylactic and therapeutic. Thus far the prophylactic use had been limited at the Massachusetts General Hospital to typhoid fever. The details of the treatment were similar to those observed in the United States Army and also their results.

The therapeutic use of vaccines might be conveniently divided into the treatment of local and general sepsis. While they had always considered that cases of local sepsis were more suitable for treatment than those in which the infection was more or less general, at times they had treated nearly all the acute general infections with vaccines.

The treatment of endocarditis due to the streptococcus viridans with an organism isolated from blood culture had not been very satisfactory. The course of the disease did not seem to have been influenced in any instance. They had treated a few cases of staphylococcus aureus septicemia, all of the subacute variety, and, although the vaccines did no harm, beneficial results had not been striking and it was the personal opinion of the essayist that these cases should not be treated in this way.

Influenzal bronchopneumonia, which existed in two types—the acute and chronic—had been treated with vaccines. In the acute type the vaccines did not seem to be of benefit. In the chronic type, which might be mistaken for tuberculosis and which quite commonly had an extension of the infection during the winter months, they had inoculated a small series of cases with autogenous vaccines, but the series was too small to permit the drawing of any definite conclusions.

In localized sepsis the disease process was less extensive and the natural defensive resources of the body were not strained as in a case of general sepsis, hence it seemed quite reasonable that vaccines should be more effective in cases in which the disease was localized. It was to be remembered that vaccines did not supply the body with any defense: they merely stimulated into action the natural protective forces.

In furunculosis the vaccines had given the most brilliant results. The extensive incisions formerly thought necessary were now made only large enough to secure adequate drainage. The vaccines were injected subcutaneously twice a week in doses from 50,000,000 to 250,000,000. Most of the cases healed promptly, but those that did not were given autogenous vaccines. Of 198 cases, 85 per cent. recovered, following this treatment. Of the remaining 15 per cent. some showed improvement, but discontinued treatment, while some had constitutional diseases, which removed them from the simple furunculosis class.

Some cases of pyelitis and colon cystitis which had proven resistant to other forms of treatment were subjected to the vaccine treatment, autogenous vaccines being used. While the number of cases was small, only 30, their results showed that 22 per cent. became bacteria-free following the treatment. In addition, 44 per cent. stated that certain symptoms, such as pain, tenesmus and frequent micturition, were relieved, although the bacilli still persisted. Thirty-four per cent. of the cases had received no benefit. Large doses of vaccine had been given in some of these cases, as much as 1,000,000,000 being given at one time without appreciable benefit or ill effect.

The treatment of gonococcus infections with vaccines was now confined to cases of gonorrheal arthritis and a few cases of resistant gonorrheal vaginitis. At present all the arthritic cases had the gonococcus complement fixation test performed before the commencement of treatment. Continued vaccine treatment did not seem to make a positive test negative. On the other hand, repeated injections of a gonococcus antigen apparently kept the test positive. Gonococcus vaccines did not confer a high degree of immunity.

They had used sensitized vaccines to some extent. The sensitizer for each emulsion was a human serum strongly positive to the gonococcus complement fixation test. They had had no experience with gonococcus emulsions sensitized with an animal serum. The results from sensitized vaccines had been identical with those secured from vaccines made in the ordinary way. While it was exceedingly difficult to compile statistics showing the results of the treatment of gonorrheal cases, since the number of cases that formerly were considered well but which still had a latent focus was quite large, and since the repeated injections of vaccines tended to keep the fixation reaction positive. However, among 149 cases 35, or 23 per cent., became clinically well. That was, the joints were not swollen, there was no effusion, no stiffness and no tenderness, and the patients were able to do their ordinary work. Of the 149 cases, 109, or 73 per cent., were relieved; that was, they were well enough to do their ordinary work, but some slight symptoms remained; 4 or 5 per cent. were not relieved. These were the chronic cases which had had several attacks of gonorrhea with arthritis.

In conclusion, Dr. Steele said they believed that the treatment by means of vaccines had a definite place in the routine work of the hospital, but that its exact value would only be determined when comparative statistics were more available than they were at present. They did not believe in the vaccine treatment for colds or other self-limited processes, nor in the use of mixed bacterial filtrates. All treatment of bacterial infections should be specific, whether that treatment was by means of vaccine, bacterial filtrate or serum.

Dr. Russell E. Cecil said that he felt that the three types of infections that were most benefited were the staphylococcus, gonococcus and bacillus coli infections. As to streptococcus infections, he had found that in certain infections of the upper respiratory tract they were of considerable benefit. There were so many kinds of streptococcus infection that it was essential to have an autogenous vaccine. He related the case of a patient with a streptococcus infection of the glands of the neck. He was so septic that it was thought he would die. The ordinary autogenous vaccines were given, but without effect. Sensitized vaccines were then given and he ran along in somewhat better condition for about a week, when his temperature became high and there was a metastasis in a joint. This was opened and drained. There were any number of positive blood cultures taken, and it was thought that the patient had an endocarditis, though he had none of the usual physical signs. He finally got well. There are many such cases in which ordinary vaccines were useless but in which a fresh autogenous vaccine was effective.

Dr. Frank Sidney Fielder said he would like to ask Dr. Steele what his opinion was in reference to the cases commonly treated with autogenous vaccines made from the root of a tooth which was considered as the source of infection. A great deal had been written recently as to the part played by defective crown and bridge work as a source of trouble around the sockets of teeth and that these infections were responsible for joint infections. He would like to know what was Dr. Steele's opinion on this subject.

Dr. Albert E. Steele, in closing the discussion, said that with reference to the streptococcus in the respiratory tract he had had little experience; most of his work had been with influenza cases. With reference to the streptococcus causing various infections, the primary seat of the infection being at the root of the tooth, at the Massachusetts General Hospital the policy would be to pull the tooth and to get rid of the focus of infection before using the vaccines, for they did not believe that vaccines would confer immunity enough to overcome an infection of that sort until after proper dental surgery had been employed.

MISCELLANY

On the evening of July 23d, at a meeting held at the Barlow Medical Library, Los Angeles, the Pediatric Society of Southern California was organized. The officers elected were as follows:—

President, W. A. Edwards, M.D.; Vice-President, P. V. K. Johnson, M.D.; Secretary and Treasurer, Victor Stork, M.D.; Councillors, Henry Dietrich, M.D., and R. B. Mixsell, M.D. The Society has for its object the advancement of the study of infancy and childhood and to this end will include as associate members those interested in the various phases of child study. It is planned to hold meetings from time to time, when papers will be read by men of authority in the field of pediatrics. An effort is being made to show the Government Child Welfare Exhibit in Los Angeles under the auspices of the Society.

DEPARTMENT OF ABSTRACTS

ORIGINAL CONDENSATIONS OF CURRENT PEDIATRIC LITERATURE
BY THE EDITORS AND THE FOLLOWING ASSOCIATES

T. Wood Clarke,	Utica, N. Y.
Coleman W. Cutler	New York City
Charles E. Farr	New York City
Morris Friedson	New York City
Gaylord W. Graves	New York City
Jerome S. Leopold	New York City
William Lyon	Jackson, Mich.
Stafford McLean	New York City
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Raymond B. Mixsell	Pasadena, Cal.
Rudolph D. Moffett	New York City
Willard S. Parker	Boston, Mass.
Mark S. Reuben	New York City
Mills Sturtevant	New York City
Samuel W. Thurber	New York City
Eugene F. Warner	St. Paul, Minn.
Edwin T. Wyman	Boston, Mass.
J. Herbert Young	Newton, Mass.

EISENDRATH, DANIEL N.: CHOLELITHIASIS IN A GIRL OF FIFTEEN YEARS. (Journal of Surgery, Gynecology and Obstetrics, May, 1915, p. 621.)

At a meeting of the Chicago Surgical Society Dr. Eisendrath presented a case of acute cholecystitis with calculi in a girl of fifteen years. There was a history of typical pain and tenderness with vomiting in attacks extending over a year. At operation the distended gall-bladder could be felt under anesthesia. It was removed and found filled with calculi. There was also a hemorrhagic condition of the mucous membrane. According to Eisendrath only 16 other cases of cholelithiasis in children are on record, and of these only 4 have had cholecystectomy performed.

C. E. F.

GOSSAGE, A. M.: THE TREATMENT OF PERNICIOUS ANEMIA WITH NEOSALVARSAN. (The Medical Chronicle, April, 1915, p. 1.)

Considerable difficulty is experienced in judging of the value of this treatment from the fact that the natural course of this disease uninfluenced by treatment is very varied and is usually marked by recurrent exacerbation and improvements while the total duration is extremely inconsistent and a further difficulty arises from our ignorance of the exact pathology of the condition. It seems clear that the essential factor is an excessive destruction of the red blood cells as evidenced by their great diminution during life. Recently, Eppinger has studied the results of splenectomy and of microscopic examination of the excised spleen and has come to the conclusion that the blood destruction takes place in the spleen itself. Eppinger's results require confirmation. In the treatment in the past of pernicious anemia the best results have been obtained by the administration of arsenic, usually in gradually increasing doses up to the limit of the patient's tolerance. Frequently very striking improvement was observed, but usually after a short time the symptoms returned and it is found that further recourse to the drug was not again followed by improvement. In some cases, however, more permanent benefits resulted. Since the introduction of organic preparations of arsenic some of the English physicians have employed neosalvarsan with favorable results; both intravenous and intramuscular injections have been tried. Neosalvarsan has obvious advantages for intramuscular injections. In 4 cases reported by Gossage excellent results followed, and he gives careful histories with careful blood examinations over many weeks in each case. He says, however, "So far there have not been a sufficient number of cases treated, nor has sufficient time elapsed to judge of the ultimate result." The operation of splenectomy has been advocated by Eppinger as a cure for this complaint and has been performed on a large number of patients in Germany, but Gossage believes it is of too recent introduction for an opinion to be formed. To sum up his work we may say that intramuscular injection of neosalvarsan affords a method of treatment for pernicious anemia by means of which improvement is likely to be more rapid and to be maintained for a longer period than was the case with the administration of arsenic by the mouth. R. D. M.

BRENNER, EDWARD C.: CONGENITAL DEFECTS OF THE ANUS AND RECTUM. (Journal of Surgery, Gynecology and Obstetrics, May, 1915, p. 579.)

Brenner's article does not lend itself readily to abstracting. Suffice it to say, it is the most complete article on the subject in recent years. It is based on a careful study of the literature, on a personal case and over 60 cases from the various hospitals of New York City. Brenner's case died and at autopsy many congenital malformations were found. This is true in many cases, according to the author. Of the 52 operations reported the mortality was 26 per cent., a figure much lower than is generally given. The type of abnormality and the type of operation necessary to relieve the condition, however, determine the mortality to a great degree. Thus the mortality for cases requiring colostomy was 66.6 per cent. Brenner's conclusions are that perineal dissections for fistulous openings are safe and give excellent results, plastic operations on the perineum for anal or ano-rectal obstruction have a mortality of 25 per cent., and the end results, as far as control or stricture is concerned, are not very good, while inguinal colostomy is only to be used as a last resort. Laparotomy and proctoplasty is a new method and promises well in selected cases.

C. E. F.

BLISS, D. C.: OPEN-WINDOW CLASSES. (The Psychological Clinic, April 15, 1915, p. 29.)

It should be noted that the writer began his test with the expectation that the results would fully corroborate the commonly accepted opinion on the fresh-air treatment for school children. The natural result of this preconceived notion would be a tendency to interpret the collected statistics to the advantage of the open-window class rather than against it. It was clear at the outset that any valid conclusion from a study of such classes must be based upon a comparison with other groups, and not upon a study of the open-window children alone. The school conditions in Montclair, where these tests were made, are very favorable for such a study. It was possible to select groups for the open-window and control classes from approximately the same type of children. This selection was aided by efficient medical supervision and expert opinion on the physical condition of the children. A definite attempt was made to check all pupils in both open-window and controlled classes on three separate lines—first, degree of nutrition, measured in terms of weight gained and lost; second, general health as indicated by the number of children absent because of illness and the total number of days lost thereby; third, mental condition indicated by the comparative amount of fatigue in the two classes. This was determined by a comparison of tests, one given half an hour after the opening of school in the morning, and a similar one given to the same class late in the session. Dr. Bliss has illustrated his article with some splendid tables representing the gain in weight and in height during this period. An examination of the charts shows a somewhat inconclusive result, though taken as a whole the classes held under ordinary conditions make more consistent gains and have fewer losses than the open-window group. Had the losses in weight of individuals during the year been confined to either one or two classes only, one conclusion would have been possible.

As a matter of fact the number of different children losing weight is distributed about equally between the two groups. A possible explanation of the discrepancy between the result in Montclair and elsewhere is that the conditions are not identical; so far as Montclair is concerned ordinary school ventilation is as good as can be secured. Large fans force quantities of warm, fresh air into all class-rooms, consequently the experiment resolves itself into showing the difference between warm, well-ventilated rooms and cold, well-ventilated rooms. R. D. M.

MARFAN, A. B.: THE PRODUCTION OF COW'S MILK FOR NURSLINGS. (Le Nourrisson, January, 1915, pp. 1-14.)

The reason why artificial feeding causes fewer deaths among infants now than in the past is because we have learned on what the milk of an animal depends for it to be a proper food for infants. (1) Formerly milk was produced from animals that were badly cared for, badly nourished or sick; such milk was of insufficient nutritive value or contained injurious elements. (2) The milk was contaminated at the milking or shortly after by microörganisms. (3) The milk was falsified through fraud by watering or by the introduction of antiseptics. (4) Even when produced under the best conditions cow's milk could not be digested by certain infants.

The cows should occupy sheds which are well aerated, kept clean, and which are constructed of material which can be kept clean, and which are kept at a constant temperature. A clean and abundant water supply is essential. The food of the cows should contain plenty of proteids and enough fat and carbohydrates to maintain their weight. All food slightly fermented should not be given to cows. Cows should not be given the foliage of vine, apples, foliage of artichoke and cruciferes, of poisonous plants, as of colchicum, milk wort, aconite, the active principle of which is eliminated in the milk. Cornevin found that the toxic principles of the following is also transmitted to the milk: the foliage of juniper, of walnut, of privet, of buckthorn, of rose-laurel, of rhododendron and of young oak. In one word, we must not allow these animals to eat anything which gives to the milk a bad taste, a bad odor, or transmits to it toxic substances. Especially to be avoided are beet-roots, distillery slop, brewery slop, residue of oil factories (tourteaux), for they are all apt to cause diarrhea in infants.

Milch cows should not be allowed to work. The composition of the milk does not depend entirely on alimentation, but also on the race of the cow.

RACE	FAT PERCENTAGE
Hollandaise	3.0
Flamande	3.25
Danoise Rouge	3.4
Durham	3.55
Ayrshire	3.7
Normande	3.8
Parthenaise	4.6
Jersiaise	5.0

The milk of cows in the last months of gestation should not be used for infants, nor should it be used for eight days after delivery. The cows should be tuberculin tested and all sick cows should be excluded from the herds. All farm hands should undergo medical supervision and all infection from outside should be excluded. Aseptic precaution in the collection and the transportation of milk are emphasized. Under strict aseptic precautions a milk can be produced which contains only 2-5 bacteria to the c.c. of milk, and which can be preserved from two to three months at 15°C. without coagulating (?) M. S. R.

LEVINSON, A.: A PHENOMENON OF AUSCULTATION IN CROUP AND PSEUDO-CROUP. (Munch. Med. Woch., 1915, pp. 146-147.)

In the numerous examinations of children, made by Levinson, affected with croup or pseudo-croup, he always tried auscultation of the larynx and he observed that the phenomena of auscultation in these conditions varied a great deal, and he was able to make a differential diagnosis between these two conditions based solely on the phenomena of auscultation. There are two spots of auscultation of the larynx—one is at the thyroid cartilage, which lies high in children (third vertebrae of neck); the other is in the fossa suprasternalis. In this auscultation of the latter the stethoscope is placed in the medial line and in the auscultation of the former a little to the left of the medial line, for in the child the larynx is almost always situated a little to the left of the medial line. It is of course necessary, first of all, to locate with the finger the point of auscultation. Levinson found that it was best to shape the ends of the stethoscope to fit over the larynx and make it a little flat on account of the short neck in the child. In older children, the ordinary form of stethoscope will do. He says it is, of course, very hard to describe the phenomena of auscultation, although he describes it as a sound impression which has to be acquired through frequent practice. Of course, he does not wish to have this phenomena placed ahead of the approved differential diagnostic symptoms, but only as an aid to diagnosis. Auscultation over the normal larynx of the child, in inspiration, produces a sipping sound, and in expiration the sound is a little longer and less distinct. Auscultation directly over the thyroid cartilage in pseudo-croup yields in inspiration a closed, impure sound, similar to the sound of m. In expiration a longer sipping sound can be heard. In croup the inspiration is an open vowel, deep and rough, an expiration is much longer and similar to a v. In the stage of progressive stenosis there are no râles perceptible, but if there is a bronchitis one hears here and there râles over the larynx, the breathing always remaining deep and dry. R. D. M.

VEALE, P. J., AND COOMBS, CAREY: CARDIAC FAILURE IN A CHILD, AGED SIX YEARS, ASSOCIATED WITH ATHEROMA OF THE PULMONARY ARTERY AND EXTREME DILATATION OF THE RIGHT VENTRICLE. (The British Journal of Children's Diseases, March, 1915, p. 72.)

On examination the child was very blue and dyspneic. There was no enlargement of the heart to the right. There was an long apical systolic murmur and the pulmonic second sound was increased. The only past illness was an attack of bronchitis one and one-half years before. There was nothing in the lungs, the urine contained a trace of albumin, and the liver, but not the spleen, was palpably enlarged. About one year later she was readmitted to the hospital. There was then marked edema of the face, feet and ankles. The urine showed nothing more than before. There was pain in the stomach and occasional vomiting. There were few signs of bronchitis. The heart showed the point of maximum intensity to be in the fifth left interspace, about one finger's breadth outside the nipple line; it was diffuse and not powerful. There was palpable pulsation during expiration at the pulmonic area. A faint pulsatile movement could also be felt to the right of the sternum. At, and external to, the point of maximum impulse a late systolic thrill was felt, and in the same area a long, definite, but not very loud bruit was heard, beginning late in systole and running up to the second sound. There were no murmurs at the base, the heart was enlarged to the right of the sternum and upward and to the left. Within two days after admission she died rather suddenly. Autopsy showed a marked enlargement of the right ventricle with atheroma of the pulmonary artery. H. R. M.

NATHAN, P. W.: MECHANICS AND PATHOLOGY OF TUBERCULOUS HIP-JOINT DISEASE IN THEIR RELATION TO ITS DIAGNOSIS AND TREATMENT. (Journal of American Medical Association, May 22, 1915, p. 1,732.)

Nathan's article is based on the careful study of the end results in over 200 cases treated at the Hospital for Ruptured and Crippled. By end results, he is careful to state, he means final results, *i.e.*, the results as seen in adult life after years of walking when full weight-bearing occurs. The article is too valuable to summarize and should be read with care by all interested in the subject. The points he emphasizes are that the disease is a very destructive one, practically always leading to marked impairment of the joint structures, that we have no adequate treatment for it, that strength for standing and walking is the thing to be aimed at, regardless of shortening or joint motion. He believes in attaining bony ankylosis as quickly as possible, by operation if necessary. The short spica is his favorite method of treatment.

C. E. F.

BUNCH, J. L.: BULLOUS ERUPTIONS IN CHILDREN. (The Urologic and Cutaneous Review, May, 1915, p. 245.)

Bullous eruptions of children include several entirely distinct groups of skin diseases, of which some, such as drug eruptions, impetigo contagioso, and bullous syphilides, are due to well-recognized causes and can easily be assigned to definite places in dermatological classifications. The appearance of bullæ as the result of direct administration of drugs to the child or transmission of such drugs to the child through the mother is rare, but it must be borne in mind that such eruptions do occur after the administration of iodids, bromids, antipyrin, arsenic, chloral and quinin. External irritants such as cantharides, mustard and other irritating plants may be the cause of bullous eruptions. Bunch describes very fully all of the above causes and gives a careful description of each one of the lesions, and it would well repay those who are interested in skin eruptions of children to read it completely. The resemblance of these diseases to one another is clinically well marked and it is perhaps allowable to assume that there is some similarity in the etiology and origin. The exact nature of toxins concerned in the production of this condition is difficult to determine. Whatever they may be they are, in all probability, manufactured in excess in the alimentary canal, or insufficiently destroyed by the liver or imperfectly secreted by the kidneys and thus produce an irritation in the skin. R. D. M

BUNTING, C. H.: DIPHTHEROID INFECTION. (Johns Hopkins Bulletin, May, 1915, p. 179.)

Diphtheroid organisms have been cultivated by Bunting from the glands in every case of un-rayed Hodgkin's disease in which attempts have been made. He has obtained it from the cervical axillary and inguinal glands and from the spleen. He has obtained successive cultures from the same patient twice. Dr. Rosenow, in his series of about 40 cases, says the organism has been constantly present and when there was an acute exacerbation he has obtained it from the blood. From an experimental standpoint Bunting has shown that in monkeys, rabbits and white rats the inoculated organisms show an affinity for lipoid tissue producing changes in it in perfect agreement with those seen in early Hodgkin's disease. Of course, the prevalence and widespread distribution of diphtheroid organisms seems to many an argument against their playing any part in Hodgkin's disease. R. D. M.

MACCALLUM, W. G.: CHONDRODYSTROPHIA FETALIS. (Johns Hopkins Hospital Bulletin, May, 1915, p. 182.)

Dr. MacCallum has made a careful pathological study of a woman who died at the age of seventy-five years and he gives us his findings in an excellent article in the Bulletin, with special reference to the bone changes which take place in this condition. The studies of the bone were the result of the examination of two infants found in the museum of the College of Physicians and Surgeons. They had been preserved in alcohol for many years and no history was obtainable. The internal organs were softened and useless for microscopic examination. The bones of the skull and long bones could, however, be investigated. On cutting through the femur longitudinally the shaft was found to be very dense and hard, with the periosteum thick. The cartilage, in which, of course, no centers of ossification had as yet appeared, were not particularly softened, although microscopic examination revealed changes in the structure somewhat resembling that which has been so ably described by Kaufmann and others. A study of the cartilage shows that in all the distal parts, and especially perhaps in that which extends backward outside the periosteum, there is a peculiar disappearance of the normal homogeneous matrix, so that the cartilage cells are single or in little groups which hang together in a network. R. D. M.

TÖLKEN, R.: EKEHORN'S METHOD OF OPERATION FOR RECTAL PROLAPSE IN CHILDREN. (DIE EKEHORNSCHE OPERATION DES MASTDARMVORFALLS BEI KINDERN.) (Deutsch. med. Woch., April 8, 1915.)

For cases which resist the simple and more conservative methods of treatment Tölken advocates the method of Ekehorn. A heavy needle is introduced through the parasacral tissues into the rectum after reduction of the prolapse, and out of the anus, where it is threaded with a heavy silk or wire suture and withdrawn. The process is repeated on the other side of the sacrum and the other end of the wire drawn through and tied to the first. In this way the rectum is suspended to the sacrum without dissection of the tissues, feeding is not interrupted, nor the normal activities of the child after the recovery from the anesthetic. With the writer's cases there are now 14 on record, and the results seem to be permanently good. No disturbances of any sort nor any recurrences were noted. C. E. F.

ASHBY, H. T.: CASE OF CEREBELLAR ABSCESS IN A CHILD NOT ARISING FROM EAR TROUBLE. (British Journal of Children's Diseases, April, 1915, p. 100.)

A female child entered the hospital with a slight bronchitis and very slight vaginal discharge. It developed signs somewhat suggestive of brain tumor and finally died. At autopsy an abscess was found in the right half of the cerebellum containing creamy pus which yielded pneumococcus on culture. The brain substance was normal, the ventricles also, and no cause for the abscess could be found. The condition was not suspected during life, as there was no nystagmus nor tendency to fall to one side more than the other. However, the child continually lay on its right side and had convulsions confined for the greater part to the right side. C. E. F.

FRIEDBERG, STANTON A.: UPPER BRONCHOSCOPY FOR A FOREIGN BODY IN AN INFANT THREE MONTHS OLD. (Journal of American Medical Association, May 15, 1915, p. 1,654.)

A three-months-old infant in some way received a closed safety-pin in the mouth. It disappeared, with no symptoms except some frothy secretion. The child soon became restless and could not cry aloud. It was taken to a hospital and an attempt made to remove the pin, but it was unsuccessful. X-ray showed the pin at the level of the sternal notch head downward and closed. Temperature, 101°F. No dyspnea, no difficulty in nursing. A bronchoscopic tube was then passed and the pin found in the trachea with the end projecting into the right bronchus. It was removed with the tube, as it could not be drawn through the latter. With the exception of a slight febrile reaction there was no complication. The voice returned at the end of twenty-four hours. C. E. F.

MOSCHCOWITZ, ALEXIS V.: THE PATHOGENESIS OF UMBILICAL HERNIA. (Annals of Surgery, May, 1915, p. 570.)

In one of his characteristic articles the author set forth in minute detail and with the most logical sequence the anatomy and pathogenesis of this very common form of hernia. He believes, and produces convincing arguments for his conviction, that all umbilical hernias are congenital in origin, and that, as in all other forms of abdominal hernia, the essential cause is a weakness in the transversalis fascia at the point of exit of a blood-vessel. All the vessels lie between the peritoneum and the transversalis fascia and must pierce the latter to escape from the abdomen. There is no sharp margin or ring, but a funnel-shaped opening, where the fascia fuses with the adventitia of the vessel wall. In the case of umbilical hernia the weakness usually exists above the obliterated umbilical vein because of a lack of embryonal tissue which is present in abundance below, around the obliterated hypogastrics. The various coverings of the hernia are discussed in detail and numerous clear diagrams portray graphically the anatomical relations. C. E. F.

DUNN, CHARLES HUNTER: SOME STUDIES IN FAT INDIGESTION. (Boston Medical and Surgical Journal, February 4, 1915, p. 167.)

This article is an abstract of a paper read at a meeting of the New England Pediatric Society, December 4, 1914.

The author characterizes the distinctive feature of fat indigestion as "inability to gain weight without fat, and inability to gain with it." (1) Predisposing causes are chronic disease (particularly tuberculosis), and previous overfeeding, especially with carbohydrate. (2) Attempt to compensate for diminished fat absorption by increasing carbohydrate or protein elements is successful only to a slight degree. (3) Excessive fat in the stools is not incompatible with satisfactory clinical progress but implies a small margin of safety against a digestive "blow up." (4) Babies who cannot gain on lactose modifications often do this without change in fat percentage when maltose is substituted for the lactose. (5) In some instances precipitated casein seemed better digested than unmodified protein, but there was no positive evidence that the use of the casein assisted fat assimilation. (6) No conclusions were attained regarding the value of lactic acid milk.

From the foregoing observations Dunn arrives at a definite summary:—

In fat indigestion the fat percentage should be low, the protein comparatively high, and the carbohydrate (preferably maltose) average.

Severe resistant cases require breast milk. Even a little of this may turn the balance toward recovery.

Whey mixtures are of little value except possibly for very young infants who vomit curds. Nor is precipitated casein of sufficient value to indicate its use as a routine.

Finally, a slow increase in toleration of fat, even coincident with loss in weight or prolonged failure to gain, is to be sought rather than temporary gain under increased fat which taxes digestive capacity. G. W. G.

GREEN, N. W.: RUPTURE OF THE GASTROHEPATIC OMENTUM. (Annals of Surgery, May, 1915, p. 631.)

A boy of eight was run over by a heavy wagon, the wheel passing over the left leg and the abdomen. He was in considerable shock and had a leukocytosis of 15,000. There was diffuse

tenderness and slight rigidity of the abdomen with indefinite dullness in both flanks. There was also a slight spot of ecchymosis over the liver. At operation the peritoneal cavity was found filled with a bloody serum and an inch and a half tear was present in the right-hand border of the gastrohepatic omentum. Recovery was uneventful with the exception of a probable leak from the stomach through the drainage opening. In the discussion of this case at the New York Surgical Society Dr. Moschcowitz recalled that he had presented an exactly similar case which recovered. Dr. Kammerer also reported a case of the same nature in all probability with recovery. This was also in a young boy.
C. E. F.

KNOTT, VAN BUREN: OVARIAN CARCINOMA IN A CHILD AGED ELEVEN. (Journal of American Medical Association, May 8, 1915, p. 1,557.)

A girl of eleven in apparently perfect health until three days before the onset of symptoms complained of severe but not localized abdominal pain. She was well developed and very robust, the only physical abnormality being a large tumor, freely movable, in the lower abdomen. The tumor fluctuated. The appendix region was sensitive to pressure. At operation the tumor was free from adhesions and consisted of the left ovary, which was removed with the left tube, and an acutely inflamed appendix. There was no fluid in the peritoneal cavity. No metastases could be found. Recovery was uneventful and the child remained in perfect health for nearly a year, when the health failed rapidly. At the second operation the whole abdomen was filled with nodular masses and free fluid. Death occurred thirty-six days later. The original tumor was cystic and weighed over 3 pounds. It contained many small cysts and proved to be a teratoma with carcinomatous degeneration. A small lump removed at the secondary operation showed carcinoma. C. E. F.

HAUGHEY, WILFRID: BACTERIAL VACCINE IN DISEASES OF THE EAR. (Annals of Otology, Rhinology and Laryngology, March, 1915, p. 15.)

The author believes that, if after a week's treatment by the usual methods, in cases of discharging ears, no results are obtained, the use of vaccines (preferably autogenous) is indicated and will clear up many cases that do not respond to other methods. He cites several cases in children where the discharge had been stopped by from one to five injections of an autogenous vaccine given at intervals of from four to seven days. In the literature quoted, the percentage of cures is in chronic purulent otitis media 28 per cent.; in mastoiditis, 67 per cent. In the former 37 per cent. improved and in the latter 24 per cent. In the former not improved 42 per cent. and in the latter 9 per cent. The showing is too good to warrant the neglect of this aid in treating these cases. S. W. T.

KARL, F.: SUCCESSFUL REMOVAL OF GASTRIC CANCER IN A BOY OF NINE. (Deutsch. med Woch., March 25, 1915.) (Abstract by Journal of American Medical Association, May 8, 1915, p. 1,620.)

The child was always frail and for three or four months had vomited repeatedly. At operation a knobby cancer of the pylorus the size of a child's fist was found and removed, the stump being planted into the jejunum. A complete recovery ensued and in three months he had more than doubled his weight. The ultimate result is, of course, very doubtful. C. E. F.

BOOK REVIEWS

DISEASES OF NUTRITION AND INFANT FEEDING. By JOHN LOVETT MORSE, A.M., M.D., Professor of Pediatrics, Harvard Medical School; Visiting Physician at the Children's Hospital; Consulting Physician at the Infants' Hospital and the Floating Hospital, Boston; and FRITZ B. TALBOT, A.B., M.D., Instructor in Pediatrics, Harvard Medical School; Chief of Children's Medical Department, Massachusetts General Hospital, etc. Pp. 346. New York: The Macmillan Company, 1915.

Seldom has so excellent a medical book made its appearance. It approaches in its accuracy and completeness the standard so often attained by text-books in the domain of pure science, and in reading it one is impressed with the evident attempt of the authors to set forth without personal bias all the essential facts of infant growth and metabolism as well as the methods which they regard as best for applying accepted principles in the successful feeding of babies. Nowhere have we seen the research of recent years in the domain of nutrition detailed with greater care and completeness or with better evidence of authority. It is a book which every physician, if he sees children, should possess.

CASE HISTORIES IN OBSTETRICS. GROUPS OF CASES ILLUSTRATING THE FUNDAMENTAL PROBLEMS WHICH ARISE IN OBSTETRICS. By ROBERT L. DE NORMANDIE, A.B., M.D., Assistant in Obstetrics, Harvard Medical School; Physician to Out-Patients. Boston Lying-In Hospital; Assistant in Gynecology, Boston Dispensary. Boston: W. M. Leonard, Publisher, 1914.

It is rapidly becoming more and more recognized that the "case history" system of instruction is of the greatest value to students of medicine. This book forms the fifth of the series and loses nothing by comparison with its predecessors. It contains seventy-six illustrative cases, all taken from the author's private or clinical work, the whole comprising a well-bound, well-printed book of over five hundred pages. Articles of especial interest to the general practitioner include a section on scopolamin and morphin anesthesia, which drugs the author regards as a distinct help to obstetrics, but not to be used indiscriminately; sections on sepsis, puerperal insanity, the baby, and a very useful chapter on the use and abuse of forceps. Abderbalder's serum reaction he considers out of the question for general practitioners, unless they have access to a well-equipped laboratory. The various dystociæ of pregnancy are very well described and handled. The various forms of normal labor are each described clearly and concisely.

GENERAL INDEX TO THE ANNALS OF SURGERY: A MONTHLY REVIEW OF SURGICAL SCIENCE AND PRACTICE. Edited by LEWIS STEPHEN PILCHER, M.D., LL.D., of New York. Volumes LI. to LX., 1910-1914.

This most handy little pamphlet of 82 pages contains in the most compact form practically all of the best surgical references during the past four years, at least of American origin. A work of this nature is little appreciated, except by those who have undertaken it and again by those who suddenly have need of it. The authors and publishers are to be congratulated upon the production of such a useful little book.

ARCHIVES OF PEDIATRICS

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EDITORIAL

ADENOIDS AND TONSILS AGAIN

It would seem that everyone must be aware of the deleterious effect of hypertrophied adenoids and tonsils. Indeed, it is with some trepidation that we approach again a subject so hackneyed to the well-informed physician, particularly the well-informed and experienced pediatrist.

It is, however, the fall of the year, the time when the first series of infectious colds runs through the community, when household after household finds one member after another succumbing to sneezing and coryza. The ruggedness gained from months in the country, whose bacteria-free air has permitted a loss of resistance to the germs of the common cold, seems in a day to give place to pallor and weakness. It is now, therefore, that the adenoid question comes bobbing up again after months of retirement, for it is the child with adenoids to whom the first cold of the year comes with greatest injury. Beginning with the slightest serous discharge, with perhaps no fever at all and slight malaise, the picture changes, as who has not seen it? to a much graver one when the redundant tissues in the nasopharynx share in the congestion and exudation. Fever, an earache, a congested membrana tympani, a collection of fluid in the middle ear, swollen tonsils, enlarged cervical lymph nodes, not to mention a middle ear suppuration, a discharging ear, and mastoïditis, these leave a child already crippled against the winter that is at hand.

Again, it is the fall of the year, when the schools open. Coming to the schools are hundreds of children, who, through fault of their parents or their physicians, do not come physically fit to profit by the instruction which the schools afford. The school physical examination, which is now so general, detects, among other things, enlarged tonsils, mouth breathing, open mouths, malocclusion, narrow noses, high palatal arches, all bearing a relationship to faulty nasopharyngeal conditions, all lessening in some degree the child's keenness of intellect, retarding him, delaying his mates, and requiring a greater effort on the part of his teachers and a greater cost to the community.

Perhaps it is only pallor, underweight and a persistently bad breath that brings a child into the category of adenoid cases. There are plenty of these who never breathe through their mouths, who seldom have colds, whose teeth are well approximated, but who remain stunted and pale, with narrow, flat chests and poor appetites. These children, too, need to have their pharynxes cleared of over-secreting lymphoid tissue.

The medical profession is to blame that children come to school age with offending adenoids and tonsils. Some of these children are deformed for life. They will always show, to the observing eye, marks of an injury which ought to have been prevented; just as many adults of to-day show to us that they, too, when children, had obstructed breathing; just as the Hapsburg family portraits show that the trouble is not a new but an ancient evil. Some of the deformities may be remedied by orthodontia at an expense too great for the multitude who need it; but there will be a continual deficit in the sum of the world's efficiency due to what these children might have obtained in the way of education, but will not; and to what they might have learned or earned in the days when they are sick from illness which might have been prevented.

The general public of fathers and mothers have become educated to realize that the removal of adenoids and tonsils which are diseased is of benefit. They seem, even, to have outstripped many physicians. For we physicians are as a class rather averse to going with the crowd, and when we see a movement, originally medical, taken up and carried forward by semi-medical or lay efforts, we are likely to hold back a bit and caution against precipitate action. On the whole, this is a wholesome tendency and has made for honesty and discouraged exploitation. But many physicians are saying, "This matter of adenoids and tonsils is being overdone"; and are falling backward in their attempt to walk with rectitude simply because so many school children suffer from nasopharyngeal obstruction and the school and health authorities have urged a rather wholesale removal of these growths. There are indeed, many operations; but there are very many children, and a good proportion of them need interference. One should never hesitate to do right because a good many other people are doing right; nor to recommend removal of adenoids simply because "everybody's doing it."

And the time for the removal of adenoids is *now,* particularly if the "now" be spring. With our dwelling places warmer than the Riviera, we may confidently operate in winter, if the need be, and not condemn the child in whom we find trouble to perhaps another siege of cold and sore throat and earache before relieving him. But if it be a question between spring and fall, by all means let it be spring. Time and again it has been impressed upon us that this is the proper procedure when with the return to town life has come this first fall cold with its train of disasters, with its operation on a weakened child and the uphill fight in gloomy November, with the measles and scarlatina of March and April shaking their gory heads ominously in the distance. Given a spring operation, the summer outdoors, a nasopharynx that permits of deep breathing and chest development, then the fall cold will be a trivial manoeuvre toward immunization and not the preliminary skirmish of a winter's fight in the trenches.

ORIGINAL COMMUNICATIONS

A PLEA FOR ACCURATE STATISTICS IN INFANTS' INSTITUTIONS *

BY HENRY DWIGHT CHAPIN, M.D.
New York City

In a Report on the Mortality in Foundling Institutions read at the last meeting of the American Association for Study and Prevention of Infant Mortality[1], it is correctly stated that the gravity of this problem cannot be given in exact terms. Practically no one knows how many infants pass through these institutions each year, whence and how they come, or whither they go at the end of their stay. "How many die, and how many of those who live lead lives of suffering and impaired usefulness, and possibly of dependency and crime, through the action of causes which might be prevented, and how these preventable causes may be removed—these are the questions for which answers must be sought."

The problem is here very well stated and no question of greater importance can come before a body of pediatricians for discussion and attempted settlement. The first essential preliminary is a full knowledge of all the facts which, at present, are unknown. This points to the necessity for a collection of accurate data to precede any efforts toward permanent improvement in methods. If a close coöperation can be established between physicians working in this special field and the institutions covering it, much may be accomplished in mapping out a programme that can attempt to conserve the good and do away with the evils that have grown up around this work.

That the operation of these institutions leaves much to be desired is known to all who are engaged in this work. This is not intended to impugn motives, as much unselfish effort and poorly requited labor is given in them. The time has come, however, to see if all this energy is expended in the wisest way, and, if not, how the methods may be improved. Enough is now known to indicate that some change of methods is desirable.

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* Read before the American Pediatric Society, May 25th, at Lakewood, N. J.

In the report previously mentioned, the New York State Department of Charities is quoted as presenting the statistics from 1909 to 1913 of eleven institutions in the State in which the death rate for babies under two years, during this period, based on the total number of children cared for, varied in the different institutions from 183 to 576 per 1,000, with an average mortality rate for the eleven of 422.5 per 1,000. During these same years the death rate for children under two years, based on the estimated population for the state at that age, was 87.4 per 1,000, or about one-fifth of that in institutions. Again, in studying a series of 1,738 institutional infants admitted at various ages under one year, 22.7 per cent. of all admitted died before completing the first month of residence, and 34.9 per cent. before completing the second month. Including all deaths, 44.3 per cent. occurred in less than one month after admission, and 68.7 per cent. in less than two months.[1]

In a recent article the writer reported a study of the mortality in ten infant asylums located in different cities of the United States.[2] The time covered varied from four to twenty years, taking the shortest and longest intervals. The rates were based on the ratio between yearly admissions and deaths and were as follows: 53.17 per cent.; 40.6 per cent.; 40 per cent.; 60 per cent.; 31.7 per cent.; 75 per cent.; 65.8 per cent.; 47.7 per cent.; 36.1 per cent.; 49.5 per cent. In all but one of these institutions deaths included all infants under two years. The ages of the deaths were not given in the reports, but as the greatest mortality is especially under one year, the showing would be worse if restricted to this age limit.

Drs. Holsclaw and Rude, of San Francisco, report the mortality in the foundling-asylums of that city as 50 per cent.[3] On boarding out babies with foster mothers in order to insure undivided care, the mortality in the same class of cases has been reduced to 12 per cent.

According to Woodward, death rates, general and special, and morbidity rates must be relied upon to show where and how sanitary work is needed and to exhibit the results of sanitary work already under way[4]. The same can be said in reference to institutional methods of work with any class in the community. It is hence exceedingly important to have accurate knowledge of all possible data as to morbidity and deaths that may throw light upon the results of methods of operation either accomplished or under way.

In order to secure such knowledge certain specific facts should be given, which a search into all the institutional reports that have been accessible to the writer shows to be rarely stated or properly analyzed. The information given in these reports is, in most cases, meager and unsatisfactory. All facts that can present a fair picture of the health and hygienic condition of an institution should be carefully presented. Special care should be taken in keeping records of babies under one year. The individual study of each baby should include the history on admission, age, physical condition, length, weight, general nutrition, previous feedings, history and record of antecedent diseases. The babies should be classified or graded by ages on admission as to physical condition, weight, length and nourishment. Summaries could then be made showing the average gain or loss under each heading. If there is gain, a comparison can then be made with that of the non-institutional baby. There should also be kept a record of the diseases acquired or contracted during the babies' stay in the institution. The summaries of the individual records should show the number of cases of each disease, of communicable diseases and mixed infections, and these diseases classified as to their preventability. Each epidemic should be traced to its source. The final summaries should show the average age on admission, the average length of stay of those who live and those who die, together with the total number of admissions and discharges. It would also be of interest to have a proper "follow up" system which could show, among other data, how many of those discharged before one year of age live to be a year old. It is doubtful if many physicians on the staffs of various institutions can give accurate data along these lines as to the conditions and results of their work.

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AN APPARENTLY COMPLETE RECOVERY AFTER OPERATION FOR CEREBELLAR TUMOR

BY LANGLEY PORTER, M.D.
San Francisco, Cal.

M. V., eleven years, school-girl; seen September 4, 1913.

Complaint—Headaches, dizziness, inability to walk straight.

Family History—Unimportant.

Previous History—Normal birth. No instrumentation. Weight at birth 13 lbs. Measles, 1910. No complications. No other exanthems. 1910 yellow jaundice, treated in San Francisco. Two months later complained constantly of being very tired, and has been so ever since. Fatigue was especially marked on exertion. No headaches, ocular or aural disturbances; occasional tonsillitis attack; no rheumatism.

Present Illness—Onset gradual, 1910; two months after attack of jaundice. Patient became very tired on exertion and wanted always to sit down. She had no pain, but could not perform the acts she desired because, as she said, her legs and feet and body were tired; this has persisted to date. In the spring of 1912 she first complained of headaches during school hours. These were vertical and mid-frontal. She does not remember whether or not these disappeared during the summer, but thinks she had them off and on. When she began school again in the fall they had become troublesome, in fact, severe. When the headaches were at their worst she would gag, but not vomit. She thinks she did not complain of sickness of the stomach at this time. It was at this time (the fall of 1912) that dizziness began to appear. She would rise in the morning with headaches and nausea, and says that whenever she had a headache she felt dizzy, but does not know whether she was dizzy in any particular sense (subjective or objective). At the end of November, 1912, she came to San Francisco and consulted an oculist of the first rank who reluctantly fitted glasses for her. She wore these for a few weeks and felt better, then the symptoms recurred with their former severity and continued so to March, 1913, when, upon attempting to walk, she felt as though she had to start suddenly in order to get going, and she looked as though she were about to fall forward. Patient said she felt as though she would fall if she did not start suddenly and walk quickly. In April, 1912, she became yellow, and consulted a local physician, who thought her to be suffering from stomach trouble, put her on a diet and kept her away from school. She remained at home, with no improvement. Her physician then advised her to come to San Francisco, and on June 1, 1913, she came to this city to visit a consultant, who treated her for tuberculosis of the right lung and ordered her to San Rafael, where she remained two months, but came to town each week for tuberculin. Patient's headache and vomiting were gradually getting worse. She had a ravenous appetite, eating every two hours. She was then brought back to San Francisco and further consultation was had. She was examined (apparently neurologically) and the diagnosis and treatment confirmed. One consultant later spoke to an aunt, and said that he thought the patient was suffering from tuberculous meningitis. The patient was placed in my hands on September 5, 1913, when a diagnosis of cerebellar tumor, possibly on the right side, was made, and Dr. Wolfsohn was asked to make a complete neurological examination and localize the tumor if possible. At the same time Dr. Sol Hyman was called, as it was obvious that surgical interference would have to be resorted to. The succeeding notes of the neurological examination are supplied by Dr. J. M. Wolfsohn.

Patient is well nourished. Normal height. Mentally, extremely bright for her age. Psychic clear; no abnormality of intellect; no speech defect; no malformation of the head. Suggestive MacEwen sign on the right posterior portion of skull.

Eyes—Lateral and rotary nystagmus slow and coarse, with quick movement on looking to the right. Pupils dilated—5 m.m. Regular, equal and react to L. and A. and consensually. Extra-ocular movements good.

Ears—Hearing acute on right and left. No discharge.

Mouth—Negative.

Neck—Thyroids small. Slight fine tremor of fingers.

Chest—Lungs and heart negative.

Abdomen—Negative.

Extremities—Considerable hypotonicity of the muscles of both thighs. All motions of lower extremities performed with full power. No spasticity.

Walk—Patient has an ataxic gait, with swinging to the right. In walking around a chair clock-wise patient falls toward the chair. Counterclock-wise, patient falls away from the chair.

Romberg—Positive. Patient tends to fall to the right. Ataxia.

Fingers to Nose Test—Right—Patient shows considerable ataxia with cross tremor. None on the left.

Heel to Knee Test—No ataxia, although the right heel is brought well above the knee. No diodiakinesis.

Pointing Test—Right—considerable ataxia. Left—none.

Cranial Nerves—

1—Negative right and left.

2—Vision roughly O.K. Reads all but finest print in magazine. No gross change in fields. Discs—on right and left there is considerable choked disc, ranging from 3½ to 5 diopters. Disc margins are obliterated. Marked choroidal atrophy, especially marked in right eye. No hemorrhages into the retinæ.

3, 4, 6—Pupils equal, dilated, regular. Both react to L. and A., consensually and in accommodation. No strabismus. Slight exophthalmos which varies from day to day. Nystagmus is coarse latterly with the quick movement to the right.

5—No sensory or motor changes.

7—Although there is slight facial asymetry, there has been no actual paresis or paralysis except at the left corner of the mouth when in repose, and at the beginning of voluntary movements.

8—Hearing normal on the right and left. Complains of continuous buzzing in the left ear in any position of head.

9, 10, 11—Normal on right and left.

12—Normal. No tremor. Atrophy. Tongue protrudes in mid-line.

Reflexes—Corneal, jaw, palatal, triceps, supinator, radial, epigastric, abdominal, knee jerks, ankle jerks, Oppenheim, Babinski, Bechterew, active and equal throughout, no clonus.

Sensibility—No disturbances in cutaneous sensibility to temperature, touch or pain.

Attitude—Patient holds head with chin toward the right shoulder and left ear toward the left shoulder.

X-ray—Of the head shows marked thinning in the right frontal region and in the cerebellar region. Otherwise separated sutures and the gyrus indentations of hydrocephalus.

Urine—Normal in all respects.

Wassermann—Not done.

Luetin—Negative. No signs of tuberculosis.

Diagnosis—The diagnosis of tumor of the right hemisphere of the cerebellum was made at this time and the patient was referred to Dr. Hyman for operation.

Operation by Dr. Sol. Hyman—

September 12, 1913—*First Stage of Exposure of Cerebellum.* Gas and ether, Dr. Botsford, anesthetist. Adler Sanitarium. Patient prone, with neck somewhat flexed. Typical Cushing cross-bow incision above superior curved line. Skin dissected back sufficient to cut muscles at lower level. Muscles separated from skull and down to second cervical vertebra in midline. All bleeding controlled. Slight hemorrhage from left emissary vein. Bi-lateral occipital emissary veins encountered, easily controlled with bone wax. Trephined openings over left and right cerebellar lobes reveal bone of paper thinness on left with no diploe; on right bone is about normal thickness. Bone removed with rongeurs so as to uncover entire cerebellum from well above lateral sinuses down to and including posterior half of foramen magnum, and from mastoid to mastoid. Small tip of bone left projecting over torcular herophili. Muscles resutured; skin sutured. No drainage. Fine silk used throughout, except horse hair for skin. Heavy gauze dressing. Light cast. Time of operation three hours. Patient bore operation extremely well until about twenty minutes before completion, when pulse, which had varied about 120°, ran up to 160°. Caffein two grains. Hypodermoclysis. Patient returned to bed. Came out of anesthetic rapidly, completely conscious. No *new* (cerebellar) symptoms, other than those manifested by the rather severe shock, Murphy drip.

September 13, 1913—Patient in apparently good condition. The pulse is weak and in the neighborhood of 140. Vomited twice. No nausea. Takes fluid well.

Urine—Faint trace of albumin; otherwise normal.

September 14, 1913—Condition about the same, except that the pulse, which is now 120-130, is of extremely good quality and dropping in rate. Temperature normal. Pupils, which previous to operation were dilated, have been normally contracted until to-day, when they are again dilated as before operation.

September 15, 1913—Pulse 100-110, very good quality. Patient on soft diet. Is quite drowsy. Occasional sharp, severe headache. Urine shows slight amount of acetone. Given soda bicarbonate. Patient is taking plenty of carbohydrate with food. Dressings completely changed. Moderate bleeding on dressings. Wound looks normal.

September 16, 1913—Patient on full diet, and is comfortable and happy. No new cerebral signs on careful examination. Temperature normal. Pulse about 90. Drowsiness has disappeared. No acetone in urine.

September 18, 1913—*Opthalmoscopic Examination:* Eyes appear same as before operation. Swelling not measured. Pupils remain dilated. React briskly to light, directly and consensually. Right pupil slightly eccentric outward.

September 19, 1913—*Second Stage. Incision and drainage of cyst of right cerebellar hemisphere.* Gas and ether.

Operation—Field cleansed with ether and painted with iodin. Stitches removed from skin and muscles, exposing occipital region from which bone was removed eight days ago. On opening muscular suture, there was an escape of cerebrospinal fluid from accidental opening of dura—between areas of first and second cervical vertebrae. Fluid escaped in jet about 4 or 5 cm. in height. After controlling oozing, dura over left cerebellar hemisphere opened by transverse incision from mastoid to occipital sinus. Then completely excised over this hemisphere within 0.5 cm. of bone edge. Brain bulges well into the wound. Right side similarly treated. Left lateral sinus incised. Very little bleeding. Hemostats at each side of rent. Before closure, sinus was doubly ligated with heavy silk sutures. Dural bridge over occipital sinus severed at site of foramen magnum (two small arteries encountered; ligated) and lifted. Suture thrown around sinus and bridge removed, exposing entire cerebellum. Left side at first bulges more than right, but in a few moments reverse is the case. Tentorium, cerebello-pontine angles and base of cerebellum, region of worm, thoroughly explored by retraction. No evidence of tumor. Trocar introduced into right cerebellar lobe; encounters marked resistance at depth of about 1 cm. Left cerebellar lobe explored; no such resistance encountered. Incision about 3 cm. long transversely, to outer side of presenting aspect of right cerebellar lobe; at depth of about 1 cm. knife encounters resistance. Retraction of wound edges with spatulæ shows cerebellar substance to be yellowish in color, otherwise no abnormality seen. Finger gently introduced, in order to determine nature of resistance, perforates its wall and enters cyst, which seems to be 4-8 cm. in diameter, involving the right cerebellar lobe inward toward worm, occupying roughly the area normally taken by the nucleus dentatus. As cyst is opened there is a rush of clear fluid, followed by slight amount of fresh oozing. Cyst wall seems perfectly smooth. As the cerebellar symptoms are so slight and these cysts are usually benign, it is deemed inadvisable to explore further to determine the nature of the same, or to cut away the great thickness of cerebellar cortex which formed the cyst covering, in order to get piece for examination. Muscles sutured with a few heavy silk and numerous fine sutures. Horse hair for skin. Gauze dressings. No drainage. Plaster cast. Time of operation 2½ hours. Patient's pulse has gradually increased to 160 and is of poor quality, necessitating 2 grs. of caffein and 600 c.c. sol. hypodermoclysis. Mild definite shock, not dangerous in character. Patient returned to bed. Pulse rapidly improved, 160, of good character. Murphy drip with glucose given.

September 20, 1913—Patient has recovered well from the operation. No nausea. Temperature about 103°. Ever since operation pulse has been 110-115. Pupils moderately contracted until today, since when they have again dilated. Patient drowsy. Complains of pain over right frontal region (probably from head-rest). Urine normal; no acetone. Is taking fluids well.

September 21, 1913—Patient still drowsy. Urine contains small amount of acetone. Sodium bicarbonate 15 grs. every four hours.

September 22, 1913—*First Dressing*—Yesterday and to-day patient is extremely lively and in good humor. Drowsiness has disappeared. Nystagmus, headache and "mixed feeling in head" have entirely disappeared. Buzzing in left ear still present.

Pupils moderately contracted and equal. Soft diet. Plaster cast and all dressings removed. Very slight seepage. No leakage of cerebrospinal fluid. Dressings replaced. This P.M. seepage through dressings. Removal of same displays leakage of cerebrospinal fluid from point about 2 cm. from right end of transverse incision. Wound redressed.

September 23, 1913—Leakage of cerebrospinal fluid is requiring change of dressings twice daily. All symptoms still absent. Temperature normal. Pulse about 90.

September 24, 1913—Leakage of cerebrospinal fluid has ceased. Patient to roof-garden in wheel-chair daily. Temperature normal.

September 26, 1913—Stitches removed. Wound perfectly healed. Patient allowed to stand on feet.

September 27, 1913—*Examination of Eyes*—Swelling in both discs has receded so that now they both measure 5 D. The edges of the temporal sides of both discs are now discernible, and the veins are much less congested and have lost their tortuosity.

September 29, 1913—Patient walks across the room. There is marked staggering, but she says there is no dizziness as before, but that her unsteadiness is due to the fact that her knees are very weak and they feel as though they "would break out through the back of the legs." No nystagmus.

September, 30, 1913—Left hospital to-day for her home.

October 6, 1913—Patient has been seen at her home and has been steadily improving in strength. She goes out to park daily and has no trouble in walking a short distance.

Patient came to office today. Walks with no staggering whatsoever; can walk across room and turn suddenly to right or left without any tendency to fall or subjective dizziness.

Ophthalmoscopic Examination—Shows the swelling in both eyes to be 3D. Tortuosity of vessels has disappeared. The vessels are still dilated at disc edge. No evidence of atrophy yet. Patient still holds head tilted to left, but can straighten it up at will.

October 8, 1913—Mother telephoned for permission to take patient to home in Ripon for a few days. Granted.

October 14, 1913—Patient presented herself, stating that yesterday morning when she awakened the buzzing in the left ear had disappeared and has not returned to date. No return of any of the previous symptoms. No ataxia of gait, but she does not step out briskly when she walks. There seems to be a slight uncertainty, which the patient states she does not feel, and cannot see that she walks any different than before. But mother says that she has not the same brisk gait. Head still held in abnormal position. Exercises prescribed for same.

On rough test distant vision seems to be poor, as she cannot distinguish the facial characteristics of the head of Aesculapius 12 feet away, thinking it a woman because of the draperies. Near vision is roughly normal. Hemianopsia present before operation has disappeared. Background not examined at this sitting.

October 23, 1913—Patient's general condition continues to improve; she now walks as before operation; her head still held to one side. Discs are subsiding, so that vessels can be followed throughout their course, although still hazy at disc edge. A certain amount of secondary atrophy is becoming apparent.

December 1, 1913—Patient presented at office to-day. Head is held slightly to one side, but has improved so much that it is probable that the normal posture will be resumed. Has no evidence whatsoever of ataxia in upper or lower extremities. No Romberg. Gait normal. No staggering whatsoever. Vision much better, so that she can now distinguish easily the face which she was unable to do on October 14th. Can read ordinary print at same distance as can the observer. Can tell time by my office clock across the room.

Ophthalmoscopic Examination—Discs show no swelling whatsoever. No tortuosity of vessels, no swelling of veins. Vessels entirely unburied throughout their course. There is a definite pallor of atrophy, but some physiological cupping remains and cribriform openings are visible. Patient is to leave city and return home shortly.

December 26, 1913—Received post-card stating that she has no headaches and "can do anything."

March 1, 1915—Patient has been in school since September, 1914. Has absolutely no disability or sign of intra-cranial disorder. Vision and balance are both perfect.

April 20, 1915—Patient is reported to be normal in every way.

RAPIDLY ADVANCING PULMONARY TUBERCULOSIS (WITH X-RAY ILLUSTRATIONS)

CASE REPORT

BY FAIRFAX HALL, M.D.

New Rochelle, N. Y.

It is probable that the most common method of acquiring the infection in pulmonary tuberculosis of young children is by breathing in tubercle bacilli. They are arrested by the mucous membrane of the respiratory tract. Some penetrate it especially if the mucous membrane is the seat of catarrhal inflammation and without producing a local lesion are taken up by the lymphatics to lodge in the bronchial lymph nodes. Tuberculous inflammation of varying degrees of intensity is set up, resulting in encapsulation or caseous softening with extension from the nodes along smaller bronchi into the lung tissue. A sudden extensive distribution may occasionally take place from a caseous node which ulcerates into a bronchus or blood vessel.

In a child dying from tuberculosis, bronchial lymph nodes are invariably found to be involved, not only at the root of the lung, but a chain of tuberculous glands follows the bronchi for some distance into the lung. In nearly all cases miliary tubercles are found in some part of the lung. Tuberculous bronchopneumonia is the most characteristic form of tuberculosis in infants and young children. In this form of the disease there are produced in the lungs large, caseous nodules or larger areas of caseation, some of which by the time the case comes to autopsy have undergone softening and cavitation. Compared with adults the pulmonary lesions in a child are more widely diffused, the predominance of the lesions in the upper lobes, though less marked, still exists.

The X-ray permits of the earliest diagnosis and is the best means of following the progress of the lesions in the lungs. Cook describes the Roentgen ray shadow cast by the normal lung as branchings from the hilus representing the bronchi, vessels and glands in that region. In the tuberculous lung the earliest sign, especially in children, is seen as enlargement and diffusion of this shadow, representing enlargement of the peribronchial glands. This sign can be found in many cases where the most searching clinical examination proves negative. Whether invasion at the apex is first discovered by the clinician or roentgenologist is largely a matter of personal equation.

Military tubercles cast small, spotted shadows aptly described by Northrup as "measles on the lungs." Larger areas of consolidation appear as more diffuse shadows. Cavities are seen as light areas in the midst of dark shadows cast by solid lung.

The following case occurred in the service of Dr. William P. Northrup and Dr. Howard Mason at the Presbyterian Hospital, New York City.

M. C., age two years. Admitted to hospital April 3, 1914.

Family History—Father living and well; mother has been known to have pulmonary tuberculosis since the birth of the child two years ago. There are three children, all living and well. No children have died. No miscarriages.

Past History—Child was full term, normal birth, breast-fed by mother for thirteen months. Measles at one year of age from which she recovered and remained well nourished and in good condition for six months. She is then said to have had pneumonia followed by discharging ears. She was very sick for three weeks and was treated at St. Luke's Hospital for seven weeks. Following this, she was sent to a convalescent home in the country. There she gained weight and seemed well, returning home two months ago. She was then kept apart from her tuberculous mother as much as possible, and had been well until two weeks before admission.

Present Illness—For the past two weeks the child has acted sick; eyes and nose have been running, and ears have again begun to discharge. She coughs, especially at night; has been feverish; appetite is poor; vomited once; bowel movements have been loose. She seems to be getting thinner.

PHYSICAL EXAMINATION ON ADMISSION:

General Appearance—Fairly well nourished little girl of two years; appears quite sick; cheeks are flushed; lips dry and cracked; coughs with frequent dry cough.

Ears—From both a profuse purulent discharge. Right ear drum grey, thickened, with perforation in anterior part. Left drum somewhat red about short process of malleus; no bulging or perforation seen.

Eyes—Conjunctiva is red, there is a watery discharge.

Nose—Discharge, mucopurulent.

Mouth and Throat—Mucous membrane red; small ulceration on inside of cheek; pharynx and tonsils congested; no exudate.

Lungs—No abnormal dullness or change in breath sounds made out. A few coarse moist râles heard at both bases posteriorly.

Heart—Parasternal dullness in first and second spaces abnormally wide. Sounds normal. Pulse 140; fair quality.

Abdomen—Negative.

Extremities and Reflexes—Normal.

Skin—Branny desquamation.

Clinical Diagnosis on Admission—Bronchitis, stomatitis, pharyngitis, conjunctivitis, double otitis media.

CLINICAL NOTES

April 10th—Twenty-second day of illness. Temperature for past week has been high, intermittent, running from normal to 103° daily; eyes are better; ears discharge freely; mouth very sore.

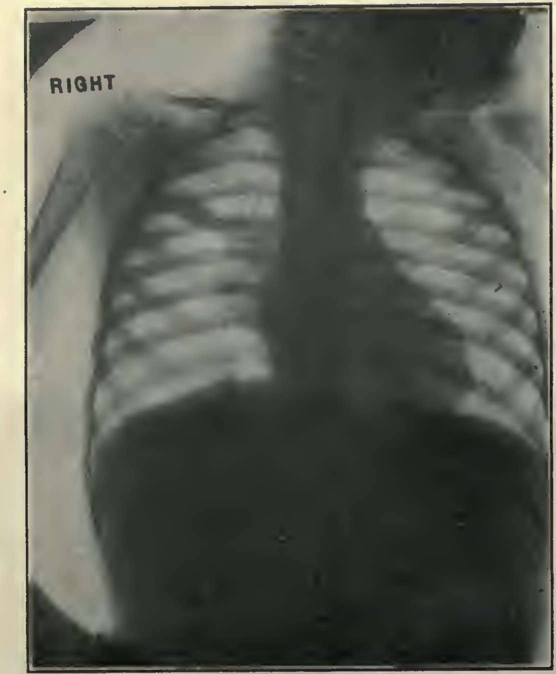
White blood cells 19,200; polynuclears 53 per cent.; lymphocytes 47 per cent. Von Pirquet skin test markedly positive.

Lungs show only very numerous, coarse râles. No signs of infiltration.

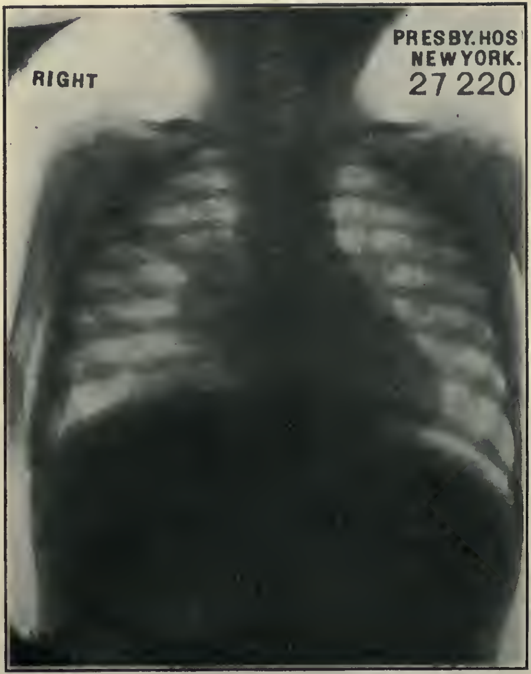
X-ray No. 1—Shadows are seen at both lung roots which suggest enlarged bronchial glands, larger on the right side. From these, the branching lung markings are more pronounced than normal, especially above the right dome of the diaphragm, where there is a dark spot. This is probably an early infiltration.

April 15th—Twenty-seventh day of illness. Mouth better. General condition unchanged. Smear from ear pus shows pus cells, no tubercle bacilli. Lung signs, no change.

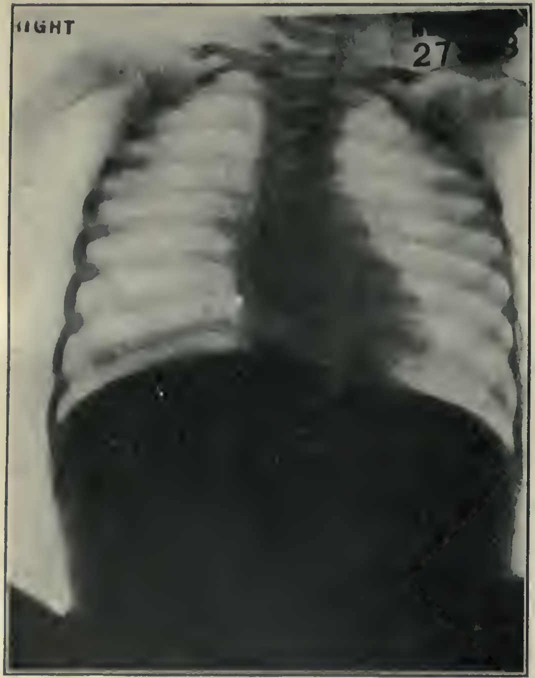
X-ray No. 2—Increase in density of shadows at both roots. The radiations from these into the lungs are more marked, especially toward right base. The shadow here is quite dense, showing an increase in infiltration.



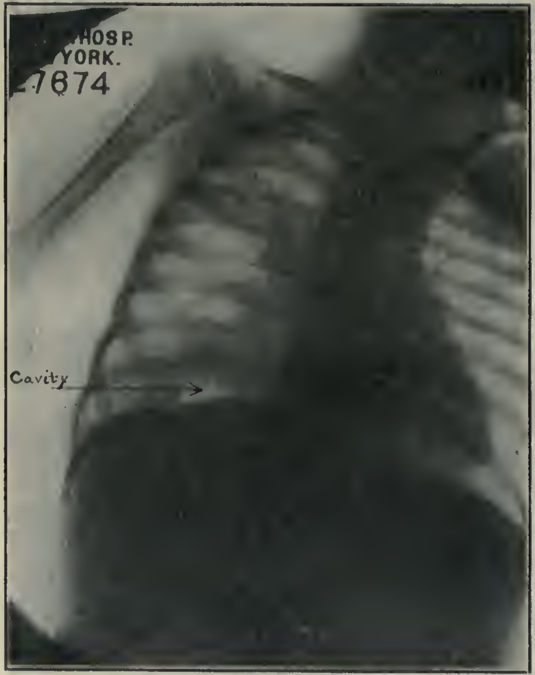
X-RAY No. 1—Shadows at hili, especially right, suggest enlarged bronchial lymph nodes. Lung markings pronounced toward right base, where there is an early lesion



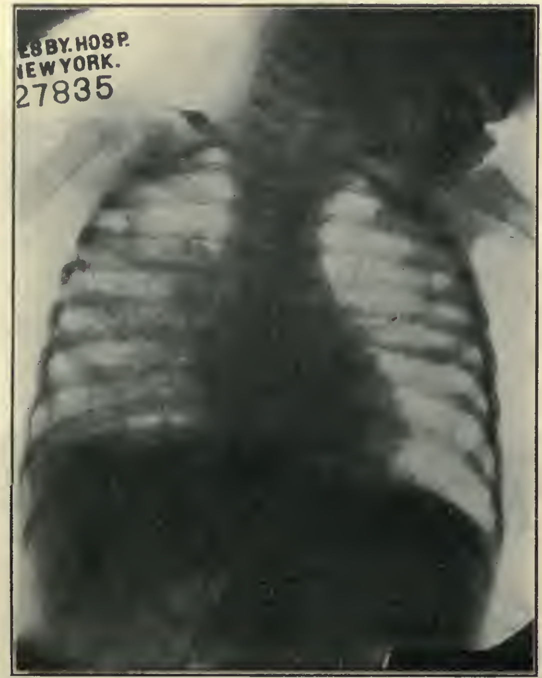
X-RAY No. 2—Marked increase in density at both lung roots. Radiations from hilus into each lung more marked at right base, where there is an area of distinct infiltration



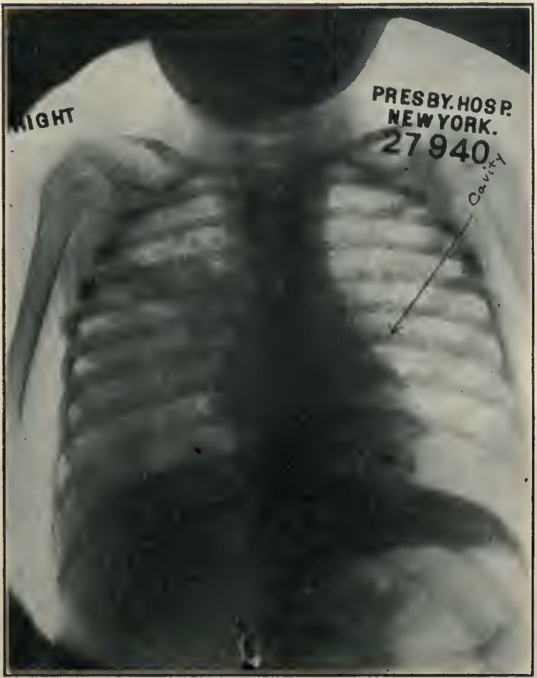
X-RAY No. 3—Shadows show extent of process in lower part of right upper lobe and base of right lower



X-RAY No. 4—Marked dissemination of tubercular process throughout both lungs. At right base is seen a distinct cavity surrounded by solid lung



X-Ray No. 5—Extent of increase in infiltration and consolidation more plainly shown by heavy mottling of both lungs, particularly the right. Cavity at the base more evident



X-Ray No. 6—Density of shadow below fourth rib on right shows almost complete consolidation with a cavity in lowest part. Diffuse mottling of less complete consolidation on left. A small cavity is seen near the root, which was verified at autopsy

April 21st—Thirty-third day of illness. Temperature continues high, reaching 102° to 104° each day. Ears and nose still discharge profusely. White blood cells 15,700; polynuclears 49 per cent.; lymphocytes 51 per cent. Widal reaction 1 to 20 negative, 1 to 100 negative. Urine has a trace of albumin. Lung signs unchanged. X-ray No. 3 shows more clearly the extent of the process in the lower part of the right upper and base of right lower lobes.

May 4th—Forty-fourth day of illness. Temperature has shown even wider daily variations, reaching 104° to 105° at night. Lungs for the first time show definite signs of infiltration. There is relative dullness at the right base below angle of scapula. Breath sounds over this area are a trifle harsh; no distinct signs of infiltration over upper lobes. Heart dullness normal, sounds normal. Fingers begin to show clubbing. Sputum examination—no tubercle bacilli, no influenza bacilli, numerous pneumococci, few pus cells.

X-ray No. 4—There is marked general dissemination of the shadows throughout both lungs with a mottled appearance caused by a more widespread infiltration. At the right base the shadow is most dense and in its center a lighter area—the first evidence of a cavity found here.

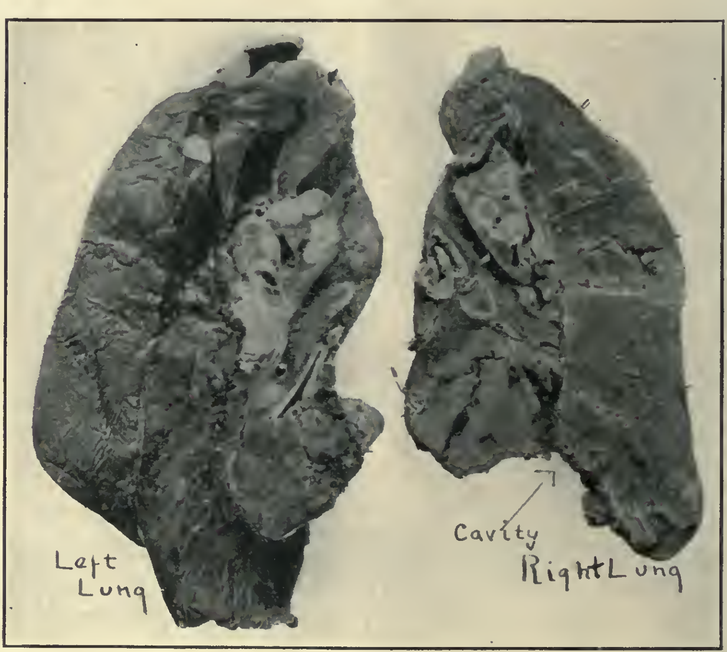
May 12th—Fifty-fourth day of illness. Marked dullness at right base with bronchial breathing below angle of scapula. More râles on right than left side; left apex relatively dull. Temperature same character as before. Child for the first time beginning to lose weight. Von Pirquet now faintly positive.

X-ray No. 5—The extent and increase in the infiltration and consolidation is even more more plainly shown by heavy mottling of both lungs, especially the right. The cavity at the right base is quite evident.

May 18th—Sixtieth day of illness. Child failing rapidly; marked loss of weight in the last three days. Signs of consolidation well marked over right lower lobe. Eye grounds show no tubercles. Liver and spleen palpable. Sputum examination—several clumps of long beaded tubercle bacilli, numerous pneumococci. Stool examination—numerous tubercle bacilli.

X-ray No. 6—On the right side below fourth rib the deep shadow would suggest almost complete consolidation with a cavity in its lowest portion. Above, less well marked infiltration at the apex. On the left there is a very diffuse mottling but much less dense. Just above the heart shadow on the left is a clear area surrounded by a dark ring, a small cavity.

May 23d—Sixty-fifth day of illness. Child grew progressively weaker with continued high temperature. Severe cough and emaciation. Died on sixty-fifth day of illness.



X-RAY No. 7—Photograph of lungs at autopsy, showing caseous bronchial glands in both lungs and a cavity in the right lung

AUTOPSY FINDINGS

Chronic pulmonary tuberculosis with cavity formation.

Tuberculosis of bronchial lymph nodes.

Tuberculosis of pleura.

Acute general miliary tuberculosis of lungs, liver, spleen and kidneys.

Fatty infiltration of liver.

Both lungs extensively bound down by fibrous adhesions.

Left lung—some plaques of fibrin are adherent to surface of pleura; there are numerous irregular raised areas whose centers show pearly white tubercles. On section, an extensive miliary tuberculosis is seen, the lung being irregularly filled by grey tubercles, varying in size from the head of a pin to confluent areas 2 cm. in diameter. Between these tubercles lung is air-containing. Lower lobe is not as involved as upper. In the lower outer portion of the lung is one small cavity 1 cm. by 2½ cm. in the center of a caseous area. A probe cannot be passed into any bronchus from the cavity. Right lung is covered with fibrous plaques; lobes are bound together. The lung feels quite firm. The outer portion of the lower lobe is wanting, in its place is a cavity 5 cm. by 3 cm. by 3 cm. Its walls are irregular, greyish in color. The blood vessels filling the centre of the cavity stand out alone, a probe passes readily into a large bronchus. On section the lung tissue is sprinkled with tubercles with air-containing tissue between. The lower lobe contains more numerous tubercles. At its lower border they are quite confluent, giving the lung a greyish appearance. Bronchial lymph nodes are caseous masses, measuring ½ to 2 cm. In one is a cavity. Bronchial mucous membrane is congested.

SUMMARY

(1) The case is evidently one of a common type of tuberculosis. A pneumococcus infection of the respiratory tract has occurred in a child with tuberculosis largely confined to bronchial lymph nodes—the tuberculosis has spread rapidly throughout the lungs and body.

(2) The X-ray made evident early the tuberculous lesions eliminating the diagnosis of simple bronchitis, influenza infection or broncho-pneumonia. It shows the progress of the disease from the hilus into the lobes, most marked in the right lower and the appearance of a cavity before these were evidenced by physical signs.

(3) The von Pirquet reaction is seen to give a marked reaction early in the disease before the patient failed. It was faint as the child became weaker and absent a few days before death.

(4) Tubercle bacilli were not found until late in the disease, when the diagnosis was already well established. Then they were found first in the stools, later in the sputum.

88 Centre Avenue, New Rochelle, New York.

SOME NEW FEATURES IN THE DIAGNOSIS OF SCURVY, WITH BRIEF REFERENCES TO METABOLIC CHANGES

BY ALAN BROWN, M.B.

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Before giving a brief account of the metabolism in scurvy, I should like to mention four important points in the diagnosis of this condition, viz: (1) Fever, (2) leukocytosis, (3) great radiability of recently extravasated blood, (4) the "white line."

Too much stress cannot be laid on the fact that many cases of scurvy, especially those which exhibit large and extensive hemorrhages, have considerable temperature, even as high as 105°, with a varying degree of polymorphonucleosis, in 2 of our recent cases reading as high as 26,000. This thermal rise is undoubtedly due to the attempt on the part of the organism to absorb the extravasated blood. In cases of this nature the X-ray is almost invaluable in order to differentiate it during the early stages from an acute invasion by some pyogenic organism.

It has been observed so far in 4 of our cases that previous to treatment or, in other words, in the early stages of the disease, the exact location of the hemorrhage was not discernible in the X-ray plates, nor did the periosteum appear involved; only when the antiscorbutic treatment was instituted and the patient again rayed after a week or two did the location of the extravasation become apparent. The point of interest is the fact that recently extravasated blood is more radiable than that which has already begun to organize, hence the apparent difficulty at times in differentiating a recent subperiosteal hemorrhage from that of pus.

It is of further interest to note that the subperiosteal hemorrhage, however slight, takes weeks, and even months, to completely organize, in spite of the fact that there exists an apparent clinical cure inside of a week or two. In one of our recent cases the extravasation had not been completely absorbed at the end of five months.

Frankel, in 1911, found certain changes in the bones in infantile scorbutus by the radiogram which he considered characteristic and of diagnostic value. These changes may be found before any of the cardinal symptoms of scurvy appear and before there is any evidence of subperiosteal hemorrhage, either clinical or on the X-ray plate.

The characteristic picture is a definite "white line" at the end of the diaphysis at the junction of the epiphysis and the diaphysis on the X-ray plate. This line represents an increased density. Later, attention was further drawn to this line by Klotz and by Riesenfeld. The former reports a case of scorbutus in which plates were taken every three weeks after the diagnosis was made and treatment instituted. He found that the "white line" persisted long after there was complete clinical cure, and, furthermore, that it could still be seen five months later.

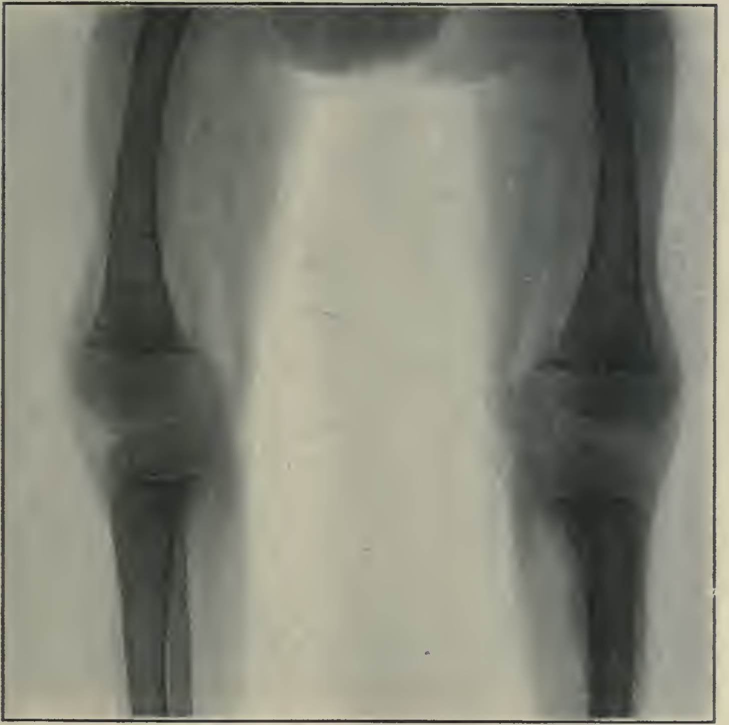

Plate I.—Illustrating the "white line" at the junction of the epiphyses with the diaphysis in an acute case of scurvy before treatment. On the X-Ray plate the line referred to is white, but on reproduction on photographic paper is represented by a darkened band. Owing to the contrast reproduction. Note the fact that there is no subperiosteal hemorrhage, illustrating the great radiability of recently extravasated blood

Talbot, of Boston, later confirmed these observations, both clinically and experimentally, and concluded that the "white line" is a constant sign in infantile scorbutus and that it may persist many months after there is a complete clinical cure, suggesting that the pathological changes in the bones are not repaired for many months and that the healing is very slow.

In all of our cases we have been able to confirm these observations and have found this feature to be of decided value in making an early diagnosis and instituting treatment; in fact, in one of our patients the pathological condition did not progress any further than indicated by the appearance of this "white line" or hemorrhage between the epiphysis and diaphysis.

Before touching on the chemical aspect of scurvy, I should like to first correlate some of the more recent clinical observations made.

Unlike hemophilia, scurvy does not depend upon any disarrangement of the different blood elements—it has been fairly well proven that in the latter condition there is no change in the coagulation time or alteration of the platelet count, both of which are such prominent features in cases of hemophilia. Lately Hess has devised a simple "capillary resistance test" for application to scorbutic patients. This is accomplished by constricting the arm by means of an ordinary blood pressure cuff to 90 mm. of mercury. In scorbutic patients minute petechiæ occur below the constriction, suggesting that there is possibly some vascular change or increased permeability of the vessel wall. In many cases of scurvy fine petechial spots may be the first to usher in what might be termed the prescorbutic stage. The distribution of the hemorrhages depends merely on chance circumstance. For example, it seems reasonable to ascribe the fact that the subperiosteal hemorrhages involve the femur most frequently to the frequent handling of the thighs in diapering the infant.

Although the relationship between rickets and scurvy is questionable, there is another disease or diathesis which we believe to be definitely associated with the incidence of infantile scurvy. We refer to the condition described by Czerny as "exudative diathesis," a term which implies a predisposition to develop exudations into the skin or the mucus membranes. Prurigo, "milk crust," eczema, recurrent bronchitis, etc., are some of the numerous manifestations of this congenital condition. It is generally agreed that a predisposition to scurvy exists, that, although a large number of infants may receive the same diet, only a few develop scorbutic symptoms. Close investigation in our series of cases revealed the fact that all suffered in more or less degrees from the exudative diathesis. The association is so evident that we have no hesitation in considering that there is a close inter-relationship between the two conditions, that exudative diathesis implies not only a diathesis for exudations, but also for the development of scurvy.

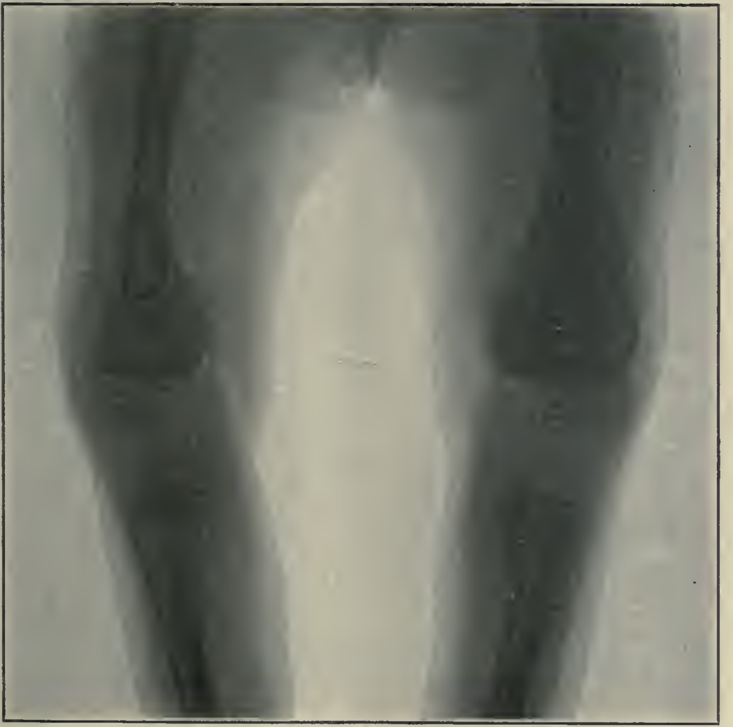

PLATE II.—Same case ten days later, showing partial disappearance of "white line." The extensive subperiosteal hemorrhage is quite distinct.

According to Hess, the vital activity of the body cells is not impaired. He applied the Schick test to a series of scorbutic infants, and from his results determined that in spite of the marked nutritional changes the cells are able to elaborate some of the important immune bodies. It would seem in this disease that the functions of certain cells are affected far more than those of others; for instance, the very changes so typical in the bones are brought about by the association or a lack of functioning of the osteoblasts combined with a normal activity on the part of the osteoclasts.

In dealing with the chemistry of scurvy it is essential to show the intimate association which exists with rickets and tetany, especially because the mineral metabolism in these last two conditions is more lucid, and that of scorbutus least definite, yet in all, there is apparently a very intimate association.

The only etiologic factor yet known to bear any constant relation to the production of scurvy is diet. Scurvy may occasionally develop with almost any variety of food. Three stand out prominently, viz., proprietary infant foods, condensed and sterilized milk. In all of these it would appear that something needed for normal healthy nutrition is wanting, and, furthermore, scurvy is not likely to follow unless an improper diet is continued for a long period, usually months. Occasionally it has developed on mother's milk which was known to contain a small amount of calcium. Scurvy is an exceedingly rare result of pasteurization—so rare, indeed, as not to be weighed against its immense advantages, while the number of cases occurring upon a diet of sterilized milk is so large that we are driven to the conclusion that the heating alone was the cause, especially since prompt recovery has frequently followed when no other change was made than to discontinue the heating.

The relation between scurvy, rickets, tetany and beri-beri is intimate, and apparently depends upon the balance of the various salts of the body; particularly sodium and potassium on the one hand and calcium and magnesium on the other, while the position of phosphorus is more variable, although the majority of observers place it along with calcium and magnesium. The sodium and potassium salts have been experimentally shown to act as excitants to the central nervous system, while the calcium and magnesium salts act as sedatives.

In unpublished observations in collaboration with Dr. Almond Fletcher we have shown that the output of sodium and potassium in tetany is accompanied by a cessation of the tetanoid group of symptoms, this output being obtained through purgation and diuresis, more especially the latter. In other words, it appears to be an excessive retention of the irritating salts, sodium and potassium, over the calcium and magnesium. We further corroborated Berend's findings, that the subcutaneous injection of a magnesium sulphate solution controls absolutely the convulsions and spasms in tetany. These, with other observations, will be reported in detail later.

The feeding of high percentages of carbohydrate (as is present in proprietary foods and condensed milk) produces a water retention within the body, which water is in combination with sodium and potassium. Three infants which we fed on high carbohydrate, ranging from 8 to 12 per cent., all of which thrived well with the exception of showing small spots of craniotabes, which means deficient calcium, exhibited at the end of six to eight weeks' observation a distinct excessive retention of sodium chloride followed by clinical tetany. All three showed varying degrees of rickets.

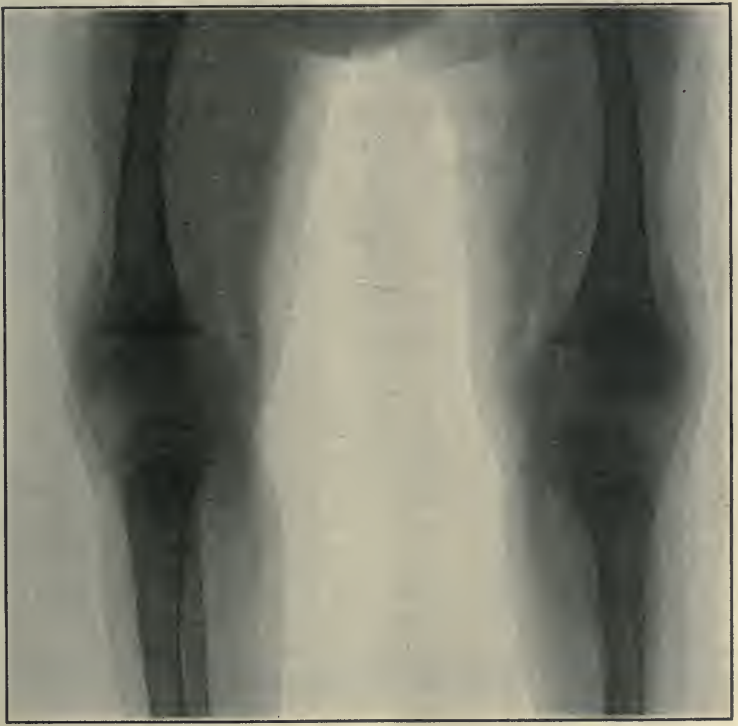

PLATE III.—Normal child of same age as shown in Plates I. and II.

Occasionally instances of nutritional edema are seen in marantic infants. Chemically they show complete NaCl retention at the height of the edema and later, as the edema subsides, the sodium chloride output may be from six to eight times normal. In 2 such cases we detected clinical tetany; a third case reported by Kehrer is on record, but supported only by clinical notes. Thus it is suggestive from these observations that the excessive retention of sodium and potassium over the calcium and magnesium may produce tetany and always rickets; and, furthermore, that the output of the irritating salts, sodium and potassium is accompanied by the cessation of the tetanoid group of symptoms and a healing of the rachitic process due to the increased calcium retention. In none of these cases was there any evidence of scurvy, although all showed rickets in varying degrees.

According to Schabad, in acute rachitis and during the early and florid stage, the calcium balance is either diminished or negative (*i.e.*, the output is greater than the intake). As convalescence commences there is an increased calcium retention and when the cure is complete the retention reaches normal. Further studies by this same observer showed that the phosphorus retention was parallel to that of calcium. Krasnogorski found a high water content in rachitic bones with a mineral content of half the normal, the calcium and magnesium being especially reduced. This fact left no doubt in the author's mind that the large amount of water in rachitic bones stands in causal relation to the poverty of calcium ions. The disturbance of the intracellular calcium metabolism must change the water content of the organism and have a powerful influence over the entrance of water into the body. This observation is indeed most striking when one considers that glycogen in being stored in the tissues carries with it twice its molecule of water, and, furthermore, that the glycogen is increased in direct proportion to the carbohydrate intake which, as previously stated, is always high in the proprietary foods.

Baumann and Howard, carrying on metabolism experiments in scurvy, found that the loss of the various food constituents through the feces was less when fruit juice was added to the diet. The total sulphur metabolism was abnormal throughout the experiment, the quantity eliminated being in excess of that ingested. Chlorin and sodium were retained during the fruit-juice period, but were excreted in excess of the intake during the preliminary period. More potassium, calcium and magnesium were retained during the fruit-juice period than during the preliminary stage. Lust and Klocmann studied the metabolism of nitrogen and the mineral salts in a typical case of scurvy in an infant eighteen months old. Observations were made for three periods of four days each—the first while the disease was at its worst and the child was not being treated; the second after a month's treatment, and the third a month later after all symptoms had disappeared. The nitrogen balance was normal at all times. The balance of mineral salts, particularly of calcium, was somewhat increased in the first period; at the second period during convalescence it was markedly decreased, and the third period it was approaching, but had not yet reached, normal, though the child was clinically well. This is in decided contrast to the conditions in rickets.

A more recent study is that of Bahrt and Edelstein, which is based not on examinations during life, but on chemical analysis of the organs after death. These authors found a decrease of ash in the bones, especially of calcium and phosphorus, very much as in rickets.

Fürst, in a dissertation on scorbutus, concluded that there was no connection between the fat, albumen, carbohydrate, cellulose or enzymes in the food and the disease. Hölst and Frölich showed that by heating the various antiscorbutic juices at different temperatures they would lose their curative properties.

Fürst, in a further series of experiments, showed that the heating of milk caused the soluble calcium salts to become insoluble and that the citric acid was also changed into insoluble calcium citrate. Scherer carried on experiments in German Southwest Africa on scorbutic children. He found the drinking water to be almost without calcium salts and to be rich in potassium and sodium. The withdrawal of the water from a scorbutic patient's dietary produced a cure.

Casimir Funk in 1913 isolated a substance which he termed vitamine from unpolished rice. The absence of this vitamine in the polished rice produced the disease beri-beri. Funk considers that rickets, scurvy, tetany and beri-beri are closely allied and apparently due to a salt exchange, but he considers that vitamine is the substance which controls the proper metabolization of the body salts, in other words, is essential toward the proper digestion and assimilation of the carbohydrates. This substance is a nitrogen-containing complex crystalline body belonging to an unknown chemical group. The vitamines are easily killed by heating, hence their destruction during the process of heating milk and in the manufacturing of the various proprietary foods. In animal experimentations this observer was able to curtail the tetanoid group of symptoms, favorably influence the calcium retention in rickets, and cure beri-beri by the introduction of vitamines into the food.

REMARKS

(1) The absence of subperiosteal hemorrhage, as shown by Roentgen examination, does not exclude scurvy, as it has been shown that recently extravasated blood is very radiable and only when the disease is well advanced and some organization of the clot has occurred does it exhibit itself on the X-ray plate.

(2) The first definite evidence of scurvy is the appearance of the "white line" which precedes the occurrence of the hemorrhages.

(3) A high temperature with a polymorphonucleosis is not incompatible with a scorbutic condition, but occurs, on the other hand, only in the severe and most advanced cases, where a faulty diagnosis of pus is apt to be made, in which cases the presence of the "white line" is a valuable aid to diagnosis.

(4) The association between scurvy, rickets, tetany and beriberi is very intimate. The production of these various ailments occurs through the improper handling of our food stuffs, altering the constituents in such a way as to completely upset the proper balance of mineral salts within the organism. Why rickets is produced in one case, tetany in another and scurvy in another it is impossible to state. In rickets the loss of calcium is definite, while the evidence at hand shows that in tetany, sodium and potassium act as the irritating salts and calcium and magnesium as the sedatives. In scurvy the calcium retention is unexplained. It yet remains to be proven whether the vitamines are, as it were, the controllers of the mineral metabolism of the body. The rôle of the thyroid and parathyroid is purely that of assisting in the general metabolic processes.

THE MANAGEMENT OF ENURESIS

BY ARTHUR NEWLIN, M.D.

Physician to the Babies' Hospital and Dispensary of the Children's Hospital, Philadelphia, Pa.

The treatment of enuresis, while rather a fertile field for literary effort, chiefly consists at the hands of most practitioners in the administration of belladonna or atropin. While these drugs are almost universally employed there is a long list of medicaments that have been exploited by diverse authors. Atropin, belladonna, strychnin, salol, boric acid, hexamethylenamin, ergot, citrate potash, bromides, organotherapy, etc., have all been recommended. Occasionally other methods of treatment have been practiced, as the use of faradism, the interruption of the flow during the act of micturition and so forth. The use of drugs by the writer has been mainly limited to atropin and belladonna; thyroid extract was tried in a small series of cases (6), but did not meet with the results claimed for it, although almost always there was a temporary improvement following its administration. In 1 case especially did the use of thyroid extract give promise of extraordinary results; this was in a choreic child of thirteen, who had always wet the bed at least once during the night and who for the first week of treatment stopped the habit entirely. She soon relapsed, however, the thyroid apparently having no effect upon her whatever. The method outlined below of course does not apply to those cases where some organic basis is found for the incontinence and is only applicable where, after examination, the conclusion is reached that the condition is due to a neurosis.

The method of management of enuresis, whether it be diurnal or nocturnal, or both, that has given the best results in the experience of the writer, consists in the simple procedure of anticipating the involuntary act by a voluntary emptying of the bladder. This, it is granted, is the usual accompaniment of any treatment, but when carried out systematically can preclude the use of drugs absolutely; it gives far better results than when the chief reliance is placed upon medicines with only perfunctory instructions as to the actual management of the child itself. This method of handling even obstinate cases of enuresis, although it embodies nothing original, is rarely carried out systematically, but when it is so conducted gives almost invariably successful results. The chief obstacle encountered is the difficulty of impressing on the mother or nurse the fact that unless the instructions are absolutely faithfully followed the result is failure.

To the child's attendant is first explained the rationale of the method and she is made to understand that eternal vigilance is the price of safety; if she hopes to be successful she must devote herself exclusively to the child day and night for the first three or four days. It rarely happens that after the third or fourth day there is need of exhaustive attention. The nurse is given a sheet of paper with the hours of the day and night placed in a vertical row at the left-hand margin under the heading of the day of the week. If the enuresis occurs, say, on average of every two hours, she is instructed to put the child on the chamber every hour for the first twelve hours. If she finds the clothing wet at any such time the hour is noted on the chart. At night the child is lifted almost as frequently during the early hours, that is, up to eleven o'clock or midnight; after that every second hour is usually all that is necessary for the first night. At the end of the first twenty-four hours she then either has a clear chart or one with several hours marked as indicating the time of the enuresis. On the second day she is guided by her chart of the previous day and she may extend the length of time between the voluntary urinations, always, however, anticipating the hours marked as "Wet" on the day before, placing the child on the chamber at least a half hour before the time indicated. Thus in each succeeding day the intervals are longer; the hours of voluntary urination may be recorded in the vertical column under the date, the act of enuresis being always marked at the hour at which it occurred. If enuresis does occur the intervals on the succeeding day are shortened about the hours that it was noted. If the case is a diurnal one, the method is easy; if nocturnal, the first two nights are troublesome, but subsequently almost always the intervals can be lengthened so that there is little discomfort to either parent or child. It usually happens that in moderately bad cases from the time that the regimé is started enuresis ceases entirely and by the end of a week, in at least the milder cases, the child will go from eleven o'clock at night to six in the morning without wetting the bed.

1804 Pine Street.

FATAL AFEBRILE NON-PARALYTIC POLIOENCEPHALITIS. TREATMENT BY AUTOINOCULATION WITH SPINAL FLUID*

BY LOUIS C. AGER, M.D.

Brooklyn, N. Y.

CASE I. Male, nineteen months. Normal development. This child had been under my care since birth. He was breast-fed for nine months, then given cow's milk and gradually transferred to a more general diet. His only previous illness was an acute gastroenteric disturbance, when he was in the country, at twelve months. At that time he was being fed with the milk from a pedigreed Holstein cow, tuberculin tested. It is quite possible that he received some milk from a herd of fancy Jerseys kept on the same farm. During the summer a child of one of the employees on the farm had an attack of *infantile paralysis*.

For about two weeks before his fatal illness the child had occasional attacks of rather forcible vomiting soon after breakfast, and he would then be entirely normal during the rest of the day. I at first attributed this to rapid eating, and it seemed to be prevented for a day or two when his mother fed him. His rectal temperature was taken repeatedly during this time and it was always normal. His weight, however, remained stationary.

On the morning of January 30th he had an attack of projectile vomiting. I examined him about 10 A.M. His temperature was normal, but he was slightly pale, languid, and irritable. I decided to make a von Pirquet test in the afternoon, but it was never made. The boy seemed to his mother to be normal again at noon and he ate a good, light lunch. About three o'clock, while in his carriage on the street, he vomited and went into convulsions, which lasted intermittently for three hours. The spasms were active and general, somewhat more severe on the right side. During the night the attacks became slighter and were quite readily controlled by 2-grain doses of chloral by rectum. The spinal fluid that evening showed moderate increase in pressure, seemed perfectly clear, but the laboratory reported a moderate increase in cell content, chiefly large mononuclears, and an increase in globulin. This indicated a poliomyelitis rather than a meningitis, but there was practically no fever and no paralysis. There were present Kernig's sign, Brudzinski's neck and contralateral signs and tache cerebrale, but the arrhythmia of pulse and respiration—which is such a universal symptom of tuberculous meningitis—was never present. The patient was seen by a prominent neurologist and another pediatrist and we all agreed on a diagnosis of tubercular meningitis.

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* Read at a meeting of the Brooklyn Pediatric Society, May 26, 1915.

On the third day of illness a second spinal puncture was made and the fluid gushed from the trochar as if it were a syringe. This is the only time that I have seen a spinal fluid flow in a steady stream. It came so quickly that I was unable to control the flow and considerable was lost. About 75 c.c. escaped in two or three minutes. Fortunately there was absolutely no bad effect at the time and a few hours later the child became partially conscious and seemed to recognize the mother and spoke a few words. This improvement lasted but a few hours. The fluid was similar to that previously drawn, but the laboratory reported a greater number of large cells and somewhat more globulin.

There was no vomiting after the first day and the patient took whey and barley water quite regularly. There was no constipation and the stools were quite normal. Toward morning on the fourth day of the disease the heart action became very irregular and weak, there was a severe convulsion and the patient died about 7 A.M.

About thirty hours after death the brain was removed. Macroscopically, it and the meninges were absolutely normal. Instead of being soft and friable, as is usually the case with an infant's brain so long after death, it was firm and easily sectioned. It was very large, the fissures were well developed and the lobes were not compressed. The weight was over 40 ounces—equalling the weight for a child of nine years. The ependyma and choroid plexus were normal and there was not a drop of fluid in any of the ventricles. The brain was first examined at the Hoagland Laboratory and then sent to the Research Laboratory of the Department of Health. Guinea pigs and a monkey were inoculated with spinal fluid and brain substance. None of the guinea pigs developed tuberculosis. Dr. Park reported as follows: "The monkey did not come down, that was inoculated, but the pathological changes seemed to clearly demonstrate that it was a case of poliomyelitis." It was also examined for negri bodies with a negative result.

The Nervous Symptoms—It is difficult to classify the nervous and mental condition of this patient. He was evidently entirely unconscious of his surroundings, and at times when absolutely undisturbed he appeared to be in coma, but he was very easily aroused. His reflexes were much exaggerated. A peculiar symptom was his tendency to bite. He bit his own hands so badly that they had to be tied. He bit one of his nurses and he would frequently bite the bars of his crib. At times he would throw himself about so that he had to be held in bed. His pupils were equally dilated and did not respond to light. He took medicine, milk and water readily at all times. Although I examined him repeatedly I could not find any paralysis. Once or twice there was an appearance of possible left side facial paralysis and for long periods the eyes were drawn far to the right, but both these conditions seemed to be due to right side spasm and not left side paralysis.

CASE 2. Female, two years and six months. Seen by the family physician on April 21st for slight digestive disturbances—had been slightly ill for about one week. No definite symptoms. Rectal temperature, 100°.

The next morning, when I saw her in consultation, the child was in a coma, from which she could be partially roused by noise or touch. Practically all the muscles were spastic and the neck and contrareflex signs were marked. There was no tache cerebrale, but there was decided increase in skin irritability, as shown by a tendency to local muscular spasm wherever the skin was touched. Both forearms and wrists were flexed and the hands were in the position seen in tetany. The muscles could be readily extended, but if this was done suddenly there was a marked tendency to convulsive spasm. Milk and water were taken quite readily. If the patient was absolutely undisturbed for some time the general spasticity greatly disappeared, but returned instantly on the slightest disturbance. The condition appeared to me to be one in which the mind and inhibitory centers were in abeyance, so that the reflex centers were uncontrolled. The temperature was 99.3°.

About 25 c.c. of slightly opalescent spinal fluid were withdrawn, pressure slightly increased. The report from the Research Laboratory was an increase in large mononuclear cells and in globulin—a polio fluid. The next day the condition was the same and I suggested a trial of autoinoculation with the spinal fluid. About 20 c.c. were withdrawn and 1 to 2 c.c. were injected into the left thigh. The next day 2 c.c. were injected, the next 5 c.c., the next 5 c.c., and two days later another 5 c.c. There was never any local reaction. After the second injection the parents were quite sure of a decided mental improvement, and after the third the reflex irritability was much decreased and there was a definite mental response to stimulation. The third specimen of spinal fluid, drawn on the sixth day of the disease, was more nearly normal. On the eighth day the patient made some efforts to speak and appeared to have some return of sight. The next day, however, there was retention of urine and the patient had to be catheterized every day. On the eleventh day there was a decided rise in temperature, and on the next day there was consolidation of the right lower and middle lobes and she died on the fifteenth day of illness. The temperature was not taken regularly, but it was between 99° and 100° most of the time and only once reached 101° before the onset of the pneumonia. There was absolutely no paralysis in this case, unless the retention of urine be so interpreted.

The improvement indicated by the change in nervous symptoms and by the more normal spinal fluid was similar to what is usually seen in the ordinary cases of "polioencephalitis" with paralysis. If the pneumonia had not developed the child might have recovered. It is, of course, impossible to say whether the treatment had any influence on the course of the disease. I would be inclined to try it in all cases of polio infection seen in the acute stages.

These 2 cases suggest several questions of practical importance.

Were they cases of infection with the poliomyelitis organism described by Flexner?

Were they a new type of this infection, or have these non-paralytic cases been mistaken for something else in the past?

What part of the nervous system was involved?

If we do not accept the opinion of Dr. Park and the other members of the Research Laboratory staff in answer to the first question we are left with no answer at all. From the symptoms and from the gross appearance of the spinal fluid the cases might have passed for tuberculous meningitis. This, however, was ruled out by the autopsy findings in the first case.

I doubt very much whether this is a new type of polio infection, although it does not appear to have been described previously. During the past few years I have made a diagnosis of tuberculous meningitis in several cases which were quite similar to these reported here. That was the diagnosis on the death certificate in the first of these cases, and it was agreed to by the four physicians who saw the case. When I invited the neurologist to be present at the autopsy he assured me that he knew exactly what I would find—the ventricles distended and the ependyma studded with tubercles. I have never experienced a greater surprise at an autopsy than I did in removing this brain. It does seem strange, however, that this type of case has not been described in the literature of polio infection. In making up the report of the 1907 New York Commission we rejected a few cases as meningitis which might have been of this type. Wickman's classification is the one generally accepted, although it is not altogether satisfactory, as is pointed out in the Rockefeller Institute Monograph. Wickman described the "encephalitic type"—"polioencephalitis" as ordinarily seen—producing spastic paralysis; and a "meningeal" type within which the symptoms of meningitis predominate, although paralyses are present sooner or later. I have seen fatal cases of both these types, but they had high fever and well-marked paralyses. In the Rockefeller Institute Monograph (page 51) a class of cases with deep stupor is described, which more nearly resemble the cases here reported. They differ, however, in showing paralysis sooner or later, in having fever, in the gradual onset of the stupor and in their recovery.

I do not feel at all competent to determine the seat of the lesion in these cases, nor the actual cause of death in the first. The Rockefeller Institute Report says: "Ultimately it may be proper to consider that profound disturbances of the sensorium in this disease are due to lesions of the silent brain areas, but we have no anatomical evidence as yet for this assumption." Although the convulsions and spasticity in these cases indicate irritation of the motor cortex, the absence of paralysis—spastic or flaccid—rules out actual injury to the motor tracts. It therefore seems reasonable to believe that the chief lesions in such fatal cases are in the "silent brain areas."

SOCIETY REPORT

THE NEW YORK ACADEMY OF MEDICINE—SECTION ON PEDIATRICS

Stated Meeting, Held October 14, 1915

WALTER LESTER CARR, M.D., IN THE CHAIR

HYPERTROPHIC PULMONARY ARTHROPATHY IN A GIRL OF ELEVEN YEARS

DR. CHARLES HERRMAN presented this patient, a girl eleven and one-half years of age. So far as was known there was no tuberculosis or syphilis in the family. The parents have been married twenty-two years and have had eight children, the eldest, twenty-two years of age, was married and had two healthy children. There had been no deaths and the mother had had no miscarriages or still births. None of the other children have any symptoms pointing to tuberculosis of the lungs, bones or lymph nodes. This patient has always been weaker than the other children. She was breast-fed for one year, began to walk at one and one-half years, and had measles when two years old. When she was seven years old, the mother noticed that she held her head to one side; later the spinal curvature became more distinct. When the patient was eight years of age, in 1912, the spinal curvature became more distinct and she was operated on by Dr. Whitman at the Hospital for Ruptured and Crippled. During the past four years she has lost weight, has a cough worse at night, but no sweats. The enlargement of the ends of the fingers began about seven months ago, that of the knees and ankles about four months ago. There has been occasional slight pain in the knees, ankles and fingers.

The patient was admitted to the Lebanon Hospital, September 1, 1915, at which time she weighed forty-nine pounds, was poorly nourished, had marked spinal curvature and pronounced deformity of the chest. There was dyspnea which became more pronounced after slight exertion. Because of the chest deformity examination of the lungs was difficult. The heart sounds were normal. There were râles in the axillary line and over both bases posteriorly. The patient complained of pain on both sides of the chest, more intense on coughing or deep inspiration. There was a small quantity of muco-purulent expectoration; large quantities were never present; it was never foul-smelling and on examination failed to show the presence of the tubercle bacillus. The cutaneous reaction, however, was positive. There was distinct atrophy of the muscles of the upper arm, the hands were cold, but not cyanotic, the ends of the fingers and toes were clubbed. The circumference of the knee and ankle joints were increased and there was some atrophy of the muscles of the leg. The patient's temperature ranged between 99° F. and 101.2° F. The urine contained a small amount of albumen but no casts. During her stay in the hospital the patient gained one pound.

Dr. Herrman exhibited radiograms of the hands showing in the metacarpal bones a thin layer of new-formed bone under the periosteum and a similar but less distinct layer in the first phalanges. Similar changes were shown in the bones of the foot. The radiograms of the knee showed layers of new-formed bone over the upper end of the tibia. The joint itself presented no changes.

About one hundred typical cases of hypertrophic pulmonary osteo-arthropathy have been reported, but of these, only seven were in children. In adults, the condition occurred five times as often in males as in females, and most of the patients were between twenty and forty years of age. Some form of chronic disease of the lungs was present in 75 per cent. of the cases, the most frequent lesion being bronchiectasis; the next in frequency was chronic pulmonary tuberculosis and empyema. One of the most plausible explanations as to the cause of the changes in the bones and the tissues surrounding the joints was that the imperfect function of the lungs caused a lack of proper elimination of toxic substances, these being absorbed into the circulation and affecting chiefly the distal parts where the circulation is slowest. The condition was occasionally seen in diseases of the liver, where the disturbed function of the organ caused imperfect elimination. The characteristic feature of the condition was the deposit of a thin layer of new bone under the periosteum of certain bones. This was shown most distinctly in radiograms, usually most marked over the lower end of the radius and ulna. It began a few inches above the end of the bone and extended down to the epiphyseal line. It was also seen on the metacarpal bones and the first phalanges, on the lower end of the tibia and fibula and on the metatarsal bones and first phalanges of the foot;

less frequently on the lower end of the humerus, upper end of the radius and ulna, and occasionally on the clavicle, ribs and iliac crest. The enlargement of the joints was due to hypertrophy of the soft parts, there being no marked change in the cartilage, no redness, no suppuration, and rarely severe pain. The clubbing of the fingers was also due to hypertrophy of the soft tissues covering the terminal phalanges, not to any change in the bone itself. In extreme cases, the nails become convex and curled at the end, and had aptly been described as parrot-beaked.

Dr. Samuel Kleinberg said that there were a few points that might be brought out in connection with this case and the first of these was with reference to the etiology of the condition. There was no history of tuberculosis in the immediate family of the patient, but there was a distinct history that at the time she was admitted to the Hospital for the Ruptured and Crippled, she had been associating with a girl in the neighborhood who had hip disease and was wearing a plaster dressing. Another interesting feature with reference to the spondylitis was that it was a very rapidly increasing one. The child was admitted to the hospital in 1912, at which time the ankylosis was very marked and a Hibb's operation was performed. The symptoms of paraplegia and the markedly exaggerated reflexes were of later development. The child improved during the year following the operation and then grew worse during the past year. There was destruction of the bodies of the fifth, sixth and seventh dorsal vertebræ and a marked deformity of the spine and his consulting colleagues had given the case a bad prognosis. That taken in connection with the fact that the deformity was getting much worse, left little to be hoped from further operation. At the time of the operation there was no evidence of tuberculosis and no spasms, but only a limitation of movement such as was evidently due to the ankylosis and the resulting deformity.

Dr. Henry W. Berg asked Dr. Herrman whether the patient had had a Wassermann taken and whether it was negative or positive. He said he was glad the section had seen the child, as he remembered having seen but 2 such cases, and did not know that there was such a large number of cases reported as Dr. Herrman had stated. As to the pathological lesions in the 2 cases coming under his observation, the one was a spinal arthropathy somewhat similar to that of locomotor ataxia. The X-ray did not show a bone process but disease of the spinal cord and nerves. The collapse of the spine seen in this case was not what one saw in Pott's disease, where it might occur in the cervical, dorsal or lumbar region, but was rather suggestive from the rapidity and completeness of the possibility of specific disease, the possibility, not the probability, of specific disease. The point that there was a certain amount of paralysis indicated that the collapse of the spine had occurred so suddenly.

Dr. Herrman, in reply to Dr. Berg's question as to whether the Wassermann had been taken, said that the Wassermann test was made and was negative, the von Pirquet, however, was positive. The heart was negative. The signs in the chest were in the axillary line and at the bases of the lungs. The lungs had been fluoroscoped, but on account of the marked deformity of the chest, one could not state definitely that tuberculosis was present. The mother had had no miscarriages and no still-births and while this might not positively exclude syphilis it carried some weight. There were no signs of specific disease in the other children and besides there was positive evidence of tuberculous infection and it was known that chronic pulmonary tuberculosis was very frequently present in the history of this condition.

A CASE OF MENINGITIS WITH COMPLETE RECOVERY

Dr. W. Morgan Hartshorn presented a child two and one-half years old, admitted to Roosevelt Hospital with symptoms of meningitis. The mother had had twelve children and no miscarriages. When six months of age, the child had pertussis and the cough persisted for a considerable length of time. The appetite was good, however, and the bowels regular. The child was breast-fed until fourteen months of age. The child's present illness began with the vomiting of green watery fluid, spasms and then general convulsive movements. Three days later there were four or five more spasms and from this time until the child was admitted to the hospital the spasms continued. At the time of admission to the hospital the child was fairly well nourished, unconscious, with staring eyes, and the right pupil larger than the left. There were furuncles on the knees and pustules on the gluteal region; these were covered with a thick crust in some places. The heart was rapid and crepitant râles were heard in the chest. There was slight opisthotonos, but no Kernig, Brudzinski, Oppenheim or ankle clonus. A diagnosis was made of meningitis complicated by bronchopneumonia. The child's temperature ranged during the first week between 100° and 104° F., and the pulse between 96 and 120. A lumbar puncture was performed and one-half c.c. of cloudy fluid withdrawn. Examination showed that the majority of the cells were lymphocytes which was unusual and very puzzling. The child remained in an unconscious condition. During the second week, the temperature varied from 101° to 106° F., and the pulse from 120 to 150. Very little spinal fluid was obtained by puncture, about 3 c.c. on one occasion, but it was still purulent. On another occasion 15 c.c. of spinal fluid was withdrawn. The child's pulse grew weaker and its condition was considered hopeless. They were undecided whether they had a primary meningitis or a meningitis following bronchopneumonia. During the third week the temperature continued high, running from 103° to 100° F., the pulse from 99 to 145, and respirations from 40 to 50. At this time they obtained 25 c.c. of clear fluid. They had given very little medication up to this time. They had given a few bromides and at the time the child was refusing to take nourishment some whiskey. They had also given some urotropin. The temperature then began to come down, but the child was extremely irritable and still unconscious. However the temperature continued to fall and the child began to take nourishment and to show some signs of intelligence. The irritability and the opisthotonos gradually disappeared, the eyegrounds became normal and the patient went on to recovery, being discharged in good condition.

CASE OF CHILD SWALLOWING FOREIGN BODY

Dr. W. Morgan Hartshorn presented a child, eighteen months old, that had swallowed a safety-pin on July 26th. The child was rushed to the hospital and radiographs taken, but they were unable to find the safety pin. The child was irritable for ten days or two weeks, and had diarrhea. The child was then discharged from the hospital and nothing more was heard from it until October 15th, when the mother reported that it had passed the safety pin.

Dr. L. E. La Fétra said that cases of epidemic meningitis even in small children frequently recovered without treatment. He recalled such a case occurring in a child fourteen months old at the Vanderbilt Clinic ten years ago. In this case thick pus was withdrawn and complete recovery had taken place. In the case just reported, the findings were rather peculiar in that when they withdrew pus, the majority of the cells were lymphocytes and he did not wonder that one would feel puzzled by that finding, but the high temperature and the blood count would indicate the case to have been of meningococcus meningitis. Dr. LaFétra said it was his custom to administer the antimeningitis serum whenever he found a cloudy spinal fluid without waiting for the complete examination. Some went on the theory that an amount of serum should be injected equal in volume to the spinal fluid withdrawn. One should make it a rule never to inject more serum than the amount of spinal fluid withdrawn. A house surgeon in his enthusiasm might inject 20 c.c. for the first dose and follow it by similar doses, even though less spinal fluid was withdrawn. Such a procedure had been followed by prompt respiratory failure and death. A good rule to follow was not to give serum more than two-thirds the volume of spinal fluid withdrawn. It sometimes happened that it was difficult to withdraw fluid and in such cases it might be necessary to puncture the ventricles and make the injection directly into them.

SCARLATINA: SOME UNUSUAL AND SEVERE TYPES

Dr. Henry W. Berg said he wished to present a schematic arrangement of the types of cases of scarlet fever such as one saw in large hospitals. The prognosis of the severe types was so serious that the physician was as much interested in the outcome as the parents, and so it was of much importance and value to know what the chances of recovery were in these serious cases. The first group of cases which he would consider were the severe toxic cases. These severe toxic cases had certain characteristics and a very uncertain prognosis. There was either an extremely severe eruption, or there might be no eruption except a collar. There was a very high temperature, persistently maintained without any attempt at resolution, when normally it should occur. The rash was punctate and almost blue. The punctate spots were sometimes almost purple and on compression became white.

Another type of cases are the toxic hemorrhagic and these never get well, while the extremely toxic cases do get well. All the hemorrhagic cases have cerebral symptoms of marked kind, resembling meningitis; the patients may be almost comatose but one does not get the Kernig, the Brudzinski or other signs characteristic of meningitis, but we do get coma. Toxic scarlatina may have cerebral symptoms as a part and parcel of the syndrome differentiating it from other types of the disease. As far as the kidneys are concerned we may find albumin, but rarely casts unless there is hemorrhage. Of the cases of the toxic type a few have a slight amount of adenitis and an eruption of the congested punctate type.

There was also a type of cases resembling somewhat diphtheria which may be designated the septic type. Physician frequently confuse this type with the toxic type. The septic type was a severe scarlatina plus the influence of a pus organism. These are usually the cases with the throat complications. In the septic cases there is rarely more than one attack of vomiting, whereas in the toxic cases the vomiting is more persistent. In the beginning of the disease in the septic cases there is a high temperature curve. The temperature of septic scarlatina has practically the features of a temperature due to infection. One of the most important symptoms is the enlargement of the glands at the angle of the jaw. All the glands in that region may become involved, making the French appellation Cardinal's Neck quite appropriate. These cases became extremely ill with the angina, some of which may be diphtheria, and they invariably show albumin in the urine. The importance of differentiating these from the toxic type lies in the fact that the toxic type has a bad prognosis while in the septic type the prognosis is better. The sepsis may be due to different organisms but the streptococcus has been diagnosed in three-fourths of the cases.

Not all the cases called hemorrhagic scarlatina really belonged to the hemorrhagic type. The true hemorrhagic cases were invariably fatal. The real hemorrhagic cases showed petechial spots and bleeding from the nose, ears, throat, intestines, kidneys or other organs. The finding of a few petechial spots did not constitute a true hemorrhagic scarlatina. Peliosis rheumatica or arthritis might be confounded with the petechial spots of hemorrhagic scarlatina. The eruptions occurring after burns, injury and puerperal scarlatina are every one of them scarlatina pure and simple. The cases in which there is doubt as to whether they are true scarlatina are of course the least severe, but it is very important to be able to differentiate between the different types because upon that depends the prognosis.

SCARLATINA: MORBIDITY AND CASE FATALITY, BY LOCALITY, SEX, AGE AND SEASON. (BASED ON THE STUDY OF OVER A MILLION CASES)

DR. HENRY H. DONNALLY, Washington, D. C., said that certain families were more susceptible to scarlet fever than others. Physicians in active practice in contagious hospitals were familiar with this fact. They also knew that certain types of children—fat, flabby, over-nourished and pasty children—bore the disease badly and that gave rise to the knowledge that there was a variation in individual susceptibility. Could these differences in family and individual susceptibilities account for differences in fatality between different small epidemics of scarlet fever? Would it be found that after all scarlet fever was a pretty uniform disease, attacking year in and year out an average number of children of whom an average number could regularly be expected to die in a fairly uniform proportion? A study of these and similar questions by means of board of health statistics had been suggested to the essayist by Dr. Howland. Starting out with all the reportable diseases, it was found that scarlet fever was the only one that admitted of such investigation with any satisfaction because it had been well reported and had undergone little change in method of treatment and also because it could usually be readily diagnosticated. Of course the value of such a study was dependent upon the completeness with which the disease was reported and they knew that all cases were not reported. Very mild cases were frequently unrecognized and very severe ones died without scarlet fever being given as the cause of death. These two types balanced up more or less, so that it is believed that the fatality figures obtained for this study gave an approximately accurate idea of true conditions.

In this study something more than 7,000,000 cases have been collected, but only those were retained where it was believed that approximately all cases and deaths were reported. Among approximately 2,000,000 cases there were 104,500 deaths, which gave a case fatality of 5.25 per cent., while the morbidity rate was 3.9; that was about four persons in each 1,000 inhabitants had scarlet fever, of which one case in twenty died. A study of the statistics of a large number of cities for different periods of time showed that there was a marked difference in the amount of scarlet fever in different localities, that in large cities the disease might be abundant in some parts and slight or absent in others and its fatality was also shown to be much greater in some places than in others. England had more scarlet fever than any other place studied; London had more than twice the amount that Paris had. Since 1892, the mean case fatality of England and Wales was 3.3 per cent. and of the Russian Empire 22.3 per cent. For the past forty years that of former New York was 12.2 per cent.; Brooklyn, 11 per cent.; Boston, 7.2; Christiania, 9 per cent.; while Norway as a whole gave 7.9 per cent.

With reference to the periodicity of scarlet fever, in all the places studied it was found that the disease was practically endemic. The fluctuations in the amount, as evidenced by the annual morbidity rates, followed no rule as regards periodicity. The amount of the disease might be increased for a single year, the previous and succeeding years being below the average, but it was more common to see two, three or less often four or five years in succession in which the amount of scarlet fever was increased. In other words, an epidemic either subsided slowly during two or three years, or might attain a greater height in its second than in its first year. It went slowly or came slowly as compared to measles, for instance, in which an epidemic attained its height quickly and subsided equally so. There might be but a single year between epidemics of scarlet fever, or there might be two, three, four or five, or more years between them, with low morbidity rates in the interim. A standard for judging the amount of scarlet fever in a given community at a given time was found only in the mean morbidity rate of the community in question.

There had been no striking reduction in the annual morbidity rates anywhere during the periods studied. They fluctuated from year to year within essentially the same limits now as years ago. The smaller the place, the greater were the annual fluctuations in morbidity rates. The amount of scarlet fever showed a tendency to decline in Norway and Philadelphia, while in the Russian Empire and in Montreal the tendency was in the opposite direction. There had been a consistent, general and marked reduction in the case fatality during the past half century and that in the absence of specific treatment. In Christiania for the past five years the case fatality had ranged from 1 to 2.8 per cent.; between forty and fifty years ago it varied from 8 to 30 per cent. In former New York and Brooklyn it was 20 to 35 per cent. forty years ago, while it had lately been around 5 per cent. In contrast to the rule of diminishing case fatality the later case fatality in the Russian Empire has been around 30 per cent., while twenty years ago it was only half this amount. In Australia and New Zealand there had been very low morbidity rates and a case fatality of only 1.5 per cent. The explanation of the lowered case fatality seemed to be that the disease was milder to-day than formerly, though the removal of scarlet fever cases to hospitals had improved the care given them and as hospital patients were usually given diphtheria antitoxin it was quite possible that this might be a factor, because combined scarlet fever and diphtheria had a high case fatality. It was also conceivable that there was an immunity which had been increasing during the 300 years since the disease was first recognized. There is a great variation of virulence in different epidemics.

A study of seasonal influences shows that the height of an epidemic may occur at any season of the year. January and December usually have the maximum number of cases, and August and September the smallest. In Paris the maximum number is quite constantly in early summer. Case fatality is highest in the summer months, lowest in the fall.

A study as to the susceptibility of the sexes to scarlet fever shows the number of male cases of scarlet fever bears almost the same ratio to the number of female cases that the number of males bears to the number of females in the entire population. There was, however, a very slightly increased susceptibility of males. During the first five years of life males are more susceptible to the disease, while between five and fifteen years females are distinctly more susceptible. The number of deaths from the disease was both absolutely and relatively greater among males than among females and furthermore the mortality rate was consistently higher for males at each period throughout life. Nearly half of all cases of scarlet fever occurred at the ages of three, four, five, six and seven years, and are pretty evenly distributed at about 10 per cent. in each of these years. Somewhat over one per cent. occur under one year of age. After the age of seven years, the susceptibility declines, until at fifteen years it is again one per cent. Between the ages of three and seven about two children out of every three contract scarlet fever if exposed to it in their homes. Few adults, though exposed, become infected with scarlet fever. The disease is most fatal during infancy. Ninety per cent. of the deaths occur under ten years of age. The death rate drops between ten and fourteen years to 1 per cent.

DR. S. DANA HUBBARD said that in discussing the "control" of scarlet fever in New York there was no such thing as "controlling" scarlet fever. This statement applied elsewhere, as this disease was always more or less prevalent in New York City, and would continue to be so as long as the present methods of control or lack of control continued to exist. The control of scarlet fever had oftentimes presented many peculiar and vexatious problems and especially when, prior to the modification of the regulations, the Department of Health had failed to receive the support of both physicians and infected families. By the time the diagnosis of scarlet fever had been made, in frequent instances, a number of exposures had taken place and particularly was this true when the patient became ill in school or in public conveyances. Frequently it was next to impossible to get both school authorities and street railway employees to appreciate the necessity for promptly removing and disinfecting infectious material. This material had been generally tracked about and later taken into homes or places where it was a danger and this was particularly true in the fly season. Parents and teachers should be taught that a child vomiting suddenly and without apparent reason was a danger; when accompanied by a fever and rash, the doctor should be called and the patient properly isolated and the places occupied during the onset of the disease should be carefully cleansed and disinfected. All persons should be taught that vomited material was very infectious and a danger to the community. The Department of Health for many years appreciated that there was a greater danger from infection early in the onset of the disease and had adopted regulations that were thought to be more rational and less unpleasant than were the regulations of the surrounding communities.

A study of "later" (secondary) cases both in New York and in Chicago had proved that where there was a close regard for regulations of quarantine these were followed by the fewest number of secondary cases. It was interesting to note that in crowded Manhattan the number of later cases, so-called, were less than in Brooklyn, and this was attributed by some to the more cheerful coöperation of the people in Manhattan than was experienced in the homes in Brooklyn. Others attributed it to the fact that there were more children in Brooklyn, but in the Department it was thought to be due to the increase in the population in Brooklyn owing to the opening of the Williamsburg bridge; this was the occasion for a large number of families moving from the East Side to Brooklyn. The study had been made shortly after this event occurred.

Another interesting circumstance was the freedom from scarlet fever of the Italian colonies of the city, and this might be due to several conditions; it was thought, however, to be attributed to the fact that in a mild form of the disease these families did not consult physicians.

Quarantine, as formerly practiced by the Department of Health, did not meet with approval and support, and a modification was made substituting medical inspectors for trained nurses, who were carefully instructed and trained in the duties of establishing and maintaining quarantine. This change had been highly successful, as indicated by the diminishing of the number of complaints against the field force. Formerly it required the services of a clerk in each borough to attend to these complaints; but since the establishment of this new method very few complaints were received and they were able to discontinue the services of these employees and put them to work at other things. The nurses were instructed to visit and instruct; the efficiency of a nurse was measured by the character of her district, as was determined by supervision of the same—the nurse being expected to see that the case was made comfortable, and, if necessary, all social welfare or uplift work necessary was to be performed by her; in fact, the motto of the Bureau was to leave a case better than it was when found. The changes to nurses had been made by other communities, which informed us that they had been similarly pleased, and no doubt the change was for the best.

A table of the incidence and mortality of scarlet fever was presented, showing the experience in New York City for the past six years, and this was a standard table. The figures showed that when averaged up for all boroughs of the city, the fatality varied from 6 per cent. to 4 per cent., the latter of which it was at present.

It was interesting to note the variations both in frequency and fatality. Particularly was it interesting to note the experience in Queens, when in 1912 there were only six deaths, but this was followed in the two succeeding years by a large increase, being 46 in 1913 and 40 in 1914, which they were unable to account for, as it didn't behave like this in any of the other boroughs and there was no apparent reason for it to do so in Queens.

Exposures to scarlet fever in schools were indeed most interesting. Mild cases, difficult of determination, and other cases undiagnosed, no doubt were the source of many infections in the schools. It was not at all infrequent that desquamating cases of scarlet fever were found in the schools. If desquamating cases returning to school were promptly detected and all pupils exposed carefully watched, such an occurrence as the present of a convalescent or undiagnosed case arriving in school need not be followed by a number of cases. But the prompt recognition and disinfection of all places visited, and careful observation of all children exposed, must be done carefully to accomplish such a result.

The remedy for school infection he said lay in the following methods: School inspectors must be alert and keen to observe the presence of infection, and they should be especially on the lookout for mild cases, and in addition, the teachers and mothers should be educated in order to be able to recognize the early cardinal symptoms of scarlet fever.

DR. HAVEN EMERSON said he did not feel competent to discuss Dr. Berg's paper, but that Dr. Donnally's paper put the matter before health officers in rather a bad light. It seemed to him that Dr. Donnally was working on a fallacious basis when he took such a large number of places from which to draw his conclusions instead of making an intensive study of a smaller number where statistics were known to be reliable. In communities in which the death rate from scarlet fever seemed high it usually meant a failure to report cases and there was lack of an effective method of impressing on the community the necessity of reporting cases. Health officers did not feel so hopeless regarding the situation as the statistics presented might lead one to suppose. A number of outbreaks of scarlet fever had been traced to the milk supply, and with an improvement in the milk supply there should be a decreasing number of cases of scarlet fever. Pasteurization of the milk supply seemed to have a definite bearing in decreasing the number of cases of scarlet fever, as well as the number of cases of septic sore throat, and even of tonsillitis. Dr. Hubbard's paper seemed to show that there had been a decided decrease in the number of cases of scarlet fever during the past two of the last six years in this city. From 1868 to 1877 the death rate from scarlet fever was 91 per 100,000; from 1908 to 1912 it was 18 per 100,000, a reduction of 73 per cent. There has been a further fall in the case rate and mortality since 1912. Dr. Emerson said it was not fair to check off unreported cases against severe undiagnosed fatal cases, since there was no evidence to show that they would balance one another. In Poughkeepsie, where they had recently had an epidemic of so-called septic sore throat, when physicians had their attention directed to the matter they had to admit that many of the cases were cases of scarlet fever.

As to immunity in scarlet fever, Dr. Park reports that in his investigations with the Schick test he has found that individuals in whom there is an immunity to diphtheria there is a coincident immunity to scarlet fever. Diphtheria and scarlet fever are likely to attack the same people and the individuals who do not take scarlet fever show a natural immunity to diphtheria. This is a most important point in connection with Dr. Hubbard's paper. The Health Department is now using a system of recording non-susceptibles. When a case of infectious disease is reported and the diagnosis verified, the patient is supplied with a certificate to the effect that he or she has had that disease and may be regarded as immune. In this way there is an increasing number of children whose attendance at school need not be interfered with, because if a case of that particular disease which a child has been certified as having had occurs in the same house and the patient can be properly isolated and watched, the child that is immune need not be kept out of school. Of course it is an economic advantage to keep as many children as possible in school regularly.

Dr. Emerson also called attention to an interesting observation made during the last year with reference to the recognition of communicable diseases. They had found that there had been a mistaken diagnosis on the part of the physician reporting the case in only 1.6 per cent. of all cases reported. This certainly was a very narrow margin of error and had a definite bearing on the statements made regarding the unreported cases of scarlet fever. If there were many unreported cases there would be a high case fatality, and it had been shown that such was not the case in New York City.

Dr. Meyer Solis-Cohen, of Philadelphia, said that he felt that it was a great disgrace if, as Dr. Donnally said, there had been no striking reduction in the morbidity rate of scarlet fever. If it is true that we are making no progress in the control of the disease, as Dr. Hubbard states, it behooves us to find out why the disease is always present. Dr. Solis-Cohen, taking exception to Dr. Donnally's statement, thought the unreported cases were far in excess of those dying without the disease being recognized. He gave several illustrations to show the prevalence of unrecognized cases. Recently a physician in Philadelphia found a case of scarlet fever and ordered the patient to the hospital. The ambulance surgeon said the case was not one of scarlet fever. As medical inspector, Dr. Solis-Cohen said he decided that the case was one of scarlet fever. On asking if any other children in the house had had a rash, he was told that 2 children had measles, and, on examining them, found them desquamating. He then asked if any children in the neighborhood had had measles and was told of 2 cases in the next street, whom he also found desquamating. In another instance he investigated the case of a child said to have a rash after having been burned; the child had scarlet fever. A supposed case of measles in another room had scarlet fever and 3 other children within the previous six weeks gave a history of measles. Two of these showed nothing abnormal, but one was found in school desquamating. This child lived with a sister whose baby also had measles and was found desquamating. These mild cases of scarlet fever should be watched, especially during an epidemic of measles or of German measles, for it is at such times that they are likely to pass unrecognized; and it is the unrecognized cases that are responsible for epidemics and for the fact that the disease is always endemic.

The remedy for the scarlet fever prevalence is not to be found in more efficient quarantine, for Dr. Hubbard has said that the efficacy of quarantine has no influence on the disease; it is to be found in the recognition and control of mild cases, and this can be brought about by popular education, as Dr. Hubbard has suggested, but not so much as to isolation and quarantine as to the dosage of mild unrecognized cases and as to how to recognize them. The fact that 90 per cent. of the cases of scarlet fever are under fifteen years of age, as Dr. Donnally has demonstrated, and that consequently many occur in school children, shows that these may be reached through the school. Only the medical inspector should not wait until 2 or 3 cases develop before examining the school, but after the first case should go and make an inspection of every child in the school and must then keep on going through the school until the period of incubation has passed since the finding of the last case. He must go even further and examine on its return to school every child recovered from ivy-poisoning, measles, and German measles, etc., for there is a possibility that these may have been scarlet fever. The mild cases do not have a physician in many instances and consequently are not reported. In order to get control of them the public must be educated so that it will regard every child with a rash as a dangerous individual and will report to the health authorities every case of eruption in their neighborhood, especially if such a case is without medical attention. We should have a law compelling the householder to report cases of contagion occurring in his house, even if the physician does not do so, just as a birth must be reported by the householder if there is no attending physician or midwife to report it. Physicians who fail to report their cases should be prosecuted; to allow one to make a practice of not reporting cases is unfair to the honest physician. It will not be difficult to discover them if these other suggestions are carried out. When children are absent from school for unknown cause they should be visited by some official, inspector, nurse or attendance officer, who will discover the presence of a contagious disease if such exists. Even where a child of one or two years of age is ill and the case is not reported, the mother usually keeps the older children home from school, and if every case of absence from school were investigated by the attendance officer of the school, this officer would find the cases of illness and should then report them.

Dr. W. L. Somerset said he wished to say just a word concerning the hemorrhage in the eruption; he did not wish to differ from Dr. Berg, but to add that certainly in scarlet fever petechiæ or small hemorrhagic areas were not necessarily rheumatic and did not have a perceptible effect on the clinical course of the disease. The discovery of the Klebs-Loeffler bacillus and the control of diphtheria by antitoxin may have had a marked effect on the morbidity and mortality of scarlet fever, since the two diseases frequently occurred together. Twenty-five years ago there was little or no attempt to distinguish between diphtheria and scarlet fever, and we now know that the scarlet fever patient develops diphtheria in many cases. Now every case of scarlet fever entering a hospital was given an immunizing dose of antitoxin and there were fewer instances of this complication.

The statement was made that 1 per cent. of the cases of scarlet fever occurred in infants under one year of age, while it was his impression that a very small fraction of 1 per cent. of the cases occurred at this early age.

In reference to the confusion of scarlet fever with milk-borne sore throat, Dr. Somerset emphasized the point that one could not safety make the diagnosis of scarlet fever *"sine eruptione."*

Dr. Frank Mansfield Sharpe said that he would like to know whether Dr. Berg had been accorded poetic license in speaking of hemorrhagic rash as he did. They did have absolutely hemorrhagic rash, which was not at all to be confused with peliosis rheumatica and that brought up the question of joint involvement. Joint involvesment was not more frequent in scarlet fever than in influenza or other infections of a mild type. They had found but twenty-two instances in a study of 600 cases.

Another important point was that in scarlet fever the severity varied directly with the throat condition. He had seen cases of scarlet fever with a typical hemorrhagic rash running through the disease without it having any influence on the course of the disease whatever. If one had a case with a hemorrhagic rash it was possible that the condition might be a hemorrhagic purpura. It seemed to him that a hemorrhagic rash was a factor that did not necessarily give a bad prognosis.

Dr. Louis Curtis Ager, Brooklyn, said that statistics were always interesting. These demonstrated what different ideas different individuals might get from the same set of figures. Old

New York had a high mortality rate in comparison with the morbidity rate. Dr. Donnally seemed to attribute this to locality, to the fact that some places seemed to show a high mortality and some a low one, but why would it not be more reasonable to say that the apparent high mortality was due to laxity in reporting cases? Dr. Donnally says that the morbidity rate is unchanged, but is it not just as reasonable to say that as the result of education the number of cases has been greatly reduced, but the total number of cases reported is much greater than formerly, so that in reality it may be that there is a higher morbidity rate as well as a lower mortality rate than formerly and we are making progress in controlling the disease.

Dr. Henry Heiman said it would be interesting to know whether cases of peliosis rheumatica were admitted to Willard Parker Hospital. If this did occur such patients should be immediately removed.

As to the albuminuria, that may occur in any infectious disease. In scarlet fever cases as a rule if nephritis develops it is usually about the third week. It requires time for the scarlet fever toxins to disintegrate the cells of the kidneys. As to the septic type and the encephalitic type of scarlatina these cases had been known to recover even when there had been a hemiplegia.

The statistics were interesting and instructive, but one point with reference to the control of scarlet fever is that the period of quarantine is entirely too long. Dr. Goldwater has curtailed the period of quarantine for measles to six days and that for scarlet fever might be curtailed to three weeks. He believed that a shorter quarantine would give better results, because people will be more ready to report cases of infectious disease and more willing to co-operate in enforcing quarantine. The physician attending a contagious disease should do his part by washing his hands, spraying his nose and gargling his throat after coming in contact with these cases, for they must not lose sight of the fact that the healthy person is just as dangerous as a carrier of infection as the person who has the disease.

Dr. Heiman said it was extremely difficult to recognize scarlet fever in certain cases and in some cases he did not believe anybody could do it.

Dr. Henry W. Berg said that as peliosis rheumatica it might be taken for scarlet fever and with reference to the nature of scarlet fever and rheumatism, the rheumatism may be under the influence of the thing that causes the polyarthritis of scarlet fever and one might find peliosis in the scarlet fever cases that developed arthritis. It was possible that the polyarthritis of scarlet fever and rheumatism were identical.

As to the poetic license in regard to the hemorrhagic eruption, Dr. Berg said he never made a diagnosis on a few petechial spots. He had been careful to say that the case must be toxic plus hemorrhage from the nose, ears, throat, intestines or other organs, and in peliosis rheumatica one had few spots and there was no hemorrhage. A man who makes a diagnosis of hemorrhagic scarlet fever on the presence of a few petechial spots has never seen true hemorrhagic scarlet fever, and that means toxic scarlet fever.

Coming to Dr. Donnally's paper, Dr. Berg congratulated him on the enormous amount of information that he had collected. The man who merely read the paper and did not think, did not grasp the large amount of information that it contained. It contained a great deal about prognosis and the utility of health department work, especially in reference to Russia. It showed that the statistical returns in Russia were very reliable and that a much larger number of cases were reported in proportion to the population in Russia than in some of our larger cities. The peasantry were probably very carefully supervised in matters of contagious disease, being accustomed to submit to authority.

Dr. Henry H. Donnally, Washington, D. C., in closing the discussion, said that he knew that all cases were not reported and had said so, and the fact that mild cases were not reported and that certain severe cases died without scarlet fever having been given as the cause of death worked to make the morbidity figures inaccurate. He had not claimed that the mortality figures were accurate and he did not believe that they were.

The point brought out by Dr. Emerson, that deductions from such a large group of cases were fallacious, was well taken, but it was interesting to get the figures roughly from such a large group. The point that different localities had a peculiar morbidity and also case mortality was well shown and there was nothing that need be discouraging to health officers in the figures. He had referred to Johannes' paper and this took up a study of the epidemics of scarlet fever in Norway beginning in the eighteenth century, and he had studied them as well as he could down into the sixties of the last century, so that one could not get better figures. He had been accorded great honors for his work. His figures showed a consistent decline in the morbidity rate of scarlet fever in Norway.

Quite a lot of cases were reported under one year of age and personally he did not believe that there was that number of cases of scarlet fever during the first year period, but one could not get back of the figures. Dr. Donnally said that Dr. Emerson's idea with reference to Pasteurized milk was very good and he would like to take it up and put it into his paper.

Dr. S. Dana Hubbard, closing the discussion, said that there was a law requiring doctors, superintendents and managers of hospitals to report cases of scarlet fever as well as cases suspected of having this disease; there was also a law requiring every person having knowledge of the existence of disease to report the fact to the Department of Health. In the latter instance, the difficulty of enforcing the ordinance was in the fact that it was difficult to obtain evidence of knowledge of the fact—that but a few laymen knew what scarlet fever was when seen.

With reference to the element of time in the quarantine of scarlet fever, it was appreciated that thirty days' minimum period was an arbitrary period pure and simple. The department had no method of determining the period of infectivity in scarlet fever and so had to accept the opinion of its medical advisers. In measles the work of Bordet and Gengou later supplemented by Anderson and Goldberger, had enabled the department to eliminate fourteen days in that disease and substitute a minimum period of five days.

In New York City the time had been reduced to thirty days in conformity with the regulations of the New York State Department of Health, but that thirty days was a purely arbitrary period and if any physician had reason to believe the same was unnecessary and inflicted in certain instances a hardship or was detrimental to the patient, if they would bring the matter to the attention of the department, giving all facts, the case would receive careful consideration and, if it was safe to do so, the case would be discharged on its own merits as the facts warranted, whether it was twenty-one days or more. Time, therefore, was for a guide only, it being appreciated that if quarantine was established and maintained upon purely scientific principles, both physicians and families would endeavor to aid the department in controlling this very frequent and annoying disease.

DEPARTMENT OF ABSTRACTS

ORIGINAL CONDENSATIONS OF CURRENT PEDIATRIC LITERATURE
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LE CRON, WILBUR L.: POST-NIDAL SINUSES. (Wisconsin Medical Journal, March, 1915, p. 401.)

The anatomical and pathological aspects of this condition are apt to escape the ordinary observer, being diagnosed as a superficial abscess, cyst or a skin irritation. Post-nidal sinus is a congenital defect of the closure of the terminal end of the neural canal in which ectodermal inclusions account for the sinuses or post-anal dermoids. These sinuses vary in length from the fraction of an inch to several inches and run more or less in a straight line superficially over the sacrum with a small pinhead-sized external opening about over the sacrococcygeal junction. The complicated forms may have several openings, not necessarily in the mid-line, and the sinus tracts may branch and be very tortuous. They are usually lined with true epithelium and may contain hair follicles and sebaceous glands and at times retention cysts are formed.

In the author's 9 cases the clinical symptoms and manifestations have been similar to those recorded by Griffin and Archibald in the Mayo Clinic publications for 1912 in their study of 31 cases.

Skin irritation and tenderness are the chief complaints. There may be retention cysts or abscess formation. In some only an intermittent discharge is noted. These symptoms sometimes persist for years and the condition is often mistaken for superficial abscess, anal fistula, ischio-rectal abscess, tubercular sinus and other more unusual conditions.

In Mayo's 20 cases 15 remained healed, 4 were not operated again and 1 was operated on three times without healing. In the complicated cases there may be several sinuses or inclusions and

the surgical treatment difficult. The proper treatment is unquestionably surgical, whereby the sinus tract may be carefully dissected out and completely excised to effect a permanent cure.
E. F. W.

Haberman, J. V.: Hereditary Syphilis. (Journal American Medical Association, April 3, 1915, p. 1,150.)

This is a very complete review of hereditary syphilis in which the author discusses the various methods by which the child may be affected, with the results of paternal and maternal syphilis. A prenatal history of this disease is at all times difficult to elicit from the parents. The disease may be transmitted to the embryo, abortion may occur, or the child may be born at term and show either transient or well-marked signs and stigmata. However, signs at birth are not constant; the secondary manifestations may appear a few weeks later, or there may be no definite signs of the disease until months or years afterward—late hereditary syphilis. It is still questionable as to whether the tertiary symptoms may occur without the previous appearance of the secondary signs. The second way in which children may be affected is the condition in which they are neuropathically or psychopathically defective. These children give no Wassermann reaction and are not themselves syphilitic. The third possibility is that the child may be unaffected by the disease. The author then takes up the various clinical appearances of syphilis and emphasizes the importance of the milder manifestations. Visceral, skin and bone symptoms appear early; the nervous system is affected about puberty. The recognized stigmata, saddle nose, Hutchinson's teeth and rhagades appear in the second period of childhood, less often in later life. The author thinks that Hutchinson's teeth are unusual. They are generally associated in the tread of corneal opacity, defective hearing and notched teeth. Rhagades are pathognomonic. Undersized, delayed sexual development, infantilism, "saber tibiæ," "scaphoid scapula" are all important for the diagnosis. Skull deformities and occasionally hydrocephalus may occur. Examination of the eye may disclose pigmentary choroiditis, iritic synechiæ, or an old keratitis. The possibility of an Argyll-Robertson pupil must be kept in mind. Deformity of the nose is common and the cubital glands are of importance. Large liver and spleen are frequently found. The various stigmata of degeneration should not be regarded necessarily as luetic. A negative Wassermann reaction means nothing. Case reports are given. H. R. M.

AIKMAN, JOHN: MEDICAL INSPECTION OF OPEN-AIR SCHOOLS. (Journal of the American Medical Association, February, 1915, p. 731.)

In 1908 the Open-Air School was introduced into America's educational system and today every city has an open-air school and the general plan is well known to all. The open-air school of Rochester, New York, was one of the first opened in this country, and Dr. Aikman has had the opportunity to study the conditions for the past six years. Medical inspection in Rochester is under the direction of the Rochester Public Health Association, which maintains a general dispensary as well, and is not under the direction of the city school inspectors. The child is really taken as a patient of the Association and all problems of physical welfare are settled by physicians.

Routine is as follows: All applications for admission are made at the Association Building, and examinations are made on a certain afternoon of each week by the medical director of the Association. If the case is suitable recommendations are made for filling the teeth, removing of tonsils and adenoids, treatment of skin conditions, and correction of anything that will prevent the child getting the most good out of its school, after the first examination is made in the home by the school nurse, who reports on the home conditions. If the patient is one coming from a family that is unable to pay a private physician for proper care the child is admitted to the Association dispensary, where all examinations and operations may be secured. The nurse, on the first visit, gives advice as to food, sleeping quarters, windows, and other details. Complete records of each case are carefully kept with blood examinations from time to time so that the improvement of the case can be carefully followed. R. D. M.

MILLIGAN, WM.: LARYNGEAL PAPILLOMATA IN CHILDREN. (The Medical Chronicle, February, 1915, p. 273.)

Benign growths of the larynx are comparatively infrequent. The various varieties consisting of papillomata and fibromata are the most common. They may develop in any part of the laryngeal cavity. Microscopically such growths are composed of masses of epithelium supported upon connective tissue. The individual growths vary in size from a small millet seed to that of a nut. Little is known of their origin and a cause of this condition is the over-use of the voice, chronic catarrh and adenoids. However, it is admitted by Milligan that a great majority of children suffering from this condition show no evidence of having any previous laryngeal catarrh. In infants and young children, where the lumen of the larynx is normally surprisingly small, their presence may cause considerable embarrassment to the breathing. Milligan believes that the drug treatment of this condition is quite ineffectual. The use of tracheotomy, in order to produce a rest of the larynx for a time, is permissible, the only objection being that sometimes the tube has to be worn for many months, or even years. The practical difficulty encountered in attempting to remove by indirect laryngoscopy a growth, or a series of growths, from the larynx of an infant or young child are so great that the method has now been abandoned in favor of removal by the method of suspension laryngoscopy. He believes that if their dyspnea is severe, a preliminary tracheotomy is advisable. After removal of such growths and if there is a tendency to. repeated recurrence he believes that the use of radium and mesothorium by local employment in a capsule is of benefit. R. D. M.

LEO-WOLF, CARL G.: THE EARLY DIAGNOSIS OF CONGENITAL SYPHILIS. (New York State Medical Journal of Medicine, January, 1915, p. 14.)

Leo-Wolf calls attention to important clinical symptoms in the diagnosis of congenital syphilis which are often overlooked. An optic neuritis will be found with relative frequency among syphilitic infants and is usually responsible for the excessive crying of these children. The color of the skin of a baby suffering from congenital lues is usually a peculiar grey or "café au lait" which it is impossible to mistake for icterus neonatorum if the cornea is examined. Macular exanthema, umbilical hemorrhages after the separation of the cord, enlargement of the cubital glands, hydrocephalus, an enlarged spleen, associated with a liver which is not only enlarged, but sharp-edged and hard, are symptoms specially mentioned. The radiogram of the long bones of syphilitic infants will disclose an indistinct epiphyseal line. Enlarged cubital glands may press upon the ulnar and radial nerves, thereby causing the child considerable pain. As a reflex action a simulated paralysis of the arms may develop. This condition is sometimes observed in the legs as the result of osteochondritis. Eclamptic seizures in children under three months, where epilepsy can be excluded, are especially suspicious. Albumen and casts in urine in considerable amounts, without conditions being present which are usually associated with their presence; infiltration of the testes, hoarseness and roughness of voice, asphyxia of newborn, beginning on first or second day of life and recurring until death, are all indications of congenital lues. The not infrequent cases of infants who do not thrive at the breast, despite the best of care, is cited. Many of these are latent cases of syphilis and are greatly benefited by neosalvarsan injections. A detailed history of such a case, which benefited by above treatment, though suffering from severe nephritis, is given by the author. E. T. W.

McKenzie, William: The Treatment of Infantile Paralysis. (The British Medical Journal, January 9, 1915, p. 60.)

McKenzie, in a very fully elaborated and most excellent article presents some interesting and useful suggestions regarding the treatment of infantile paralysis. According to the author a paralyzed muscle must first be given both immediate and anatomical rest. All sources of irritation to cord, nerve and muscle must be removed. This can best be accomplished by placing the muscle in a position where its origin and insertion are on the same horizontal plane. The method followed, which is described in detail, was to begin each day at zero and gradually work up to and a little beyond what was achieved the previous day. Splints were used while necessary to keep the limb at rest, and also to give sufficient support to assist weak muscles in functioning. McKenzie states: "A patient may be unable when on the side to lift the limb which remains flexed at the knee, but able when an artificial quadriceps is provided, that is, a piece of board behind the knee to stiffen it, not only to lift the heel off the bed on the side, but even on the back." If the carefully explained educative system is employed McKenzie believes there will be comparatively little necessity for surgical interference. He discourages the use of arthrodesis and suggests splints and specially stiffened boots instead. His personal experiences with contractures and muscle transplantation are reviewed. He believes this is not a disease which can be successfully treated through the medium of a serum because "by the time the correct diagnosis has been made the chances for a preventive or curative serum are gone." The use of thymus gland he approves, and prescribes from 15 to 24 grains in twenty-four hours. It is only to be considered a helpful adjunct to the re-educative treatment. Referring to massage, the author states: "Until a muscles has recovered it should only be massaged in the zero position, and in the mildest manner possible. It is erroneous to expect massage to initiate function, but it may undoubtedly strengthen function found to be present in the muscle. A paralyzed limb should be handled as carefully as a fractured one. The muscle enlarges not from the amount of work done *for it*, but from the *amount of work it does itself*. E. T. W.

Marfan, A. B.: The Teaching of Hygiene and Maladies of First Infancy. (Le Nourrisson, November, 1914, pp. 313-335.)

In the beginning of the twentieth century, of every 1,000 live-born infants in France, 150 died in the first year (of which 46 died in the first month, and 17 in the first five days), 50 in the second year, 25 in the third year, 17 in the fourth year, 13 in the fifth year; 56 in the fifth to tenth year, and 34 from the tenth to fifteenth year. The general mortality was 22 per 1,000, and of those under forty only 11 per 1,000 of the living died. In France at the beginning of the twentieth century about 800,000 infants were born every year, of which about 120,000 died before they were one year old; however, infant mortality has been on the decrease, as the following figures show:—

From 1892–1895	258 per 1,000
" 1896–1900	229 " "
" 1901–1905	164 " "
In 1906	145 " "
" 1909	143 " "

The most common causes of early deaths in infancy are: congenital debility, hereditary syphilis, digestive and nutritive disturbances, as a result of deprivation of breast milk; then follows pneumonia. The deaths which are dependent on prenatal causes can be reduced by "eugénique" and by "eugennétique" influences.

Deprivation of maternal nursing is the cause, direct or indirect, of the death of a large number of newborn infants. In Norway and Ireland, where the majority of women nurse their infants, the mortality is less than 10 per cent.; in Germany and Austria, where breast feeding is not so prevalent, infant mortality is about 25 per cent. He finds that the most common reasons why women do not nurse their infants are indifference, egoism, misery, outside occupation and ignorance; egoism and indifference cannot be combated; the other factors can be influenced by law. The Strauss law prevents employment of gravid women. "The Mutualités Maternelles," founded by Pousineau, gives succor to nursing women. Other helps are the pouponnières, free restaurants, and Article 8 of Roussel's law, relative to the protection of infants; day nurseries and nursing-rooms in factory, shops and the infant welfare stations. Ignorance can only be combated by higher medical education and medical missionary work.

In speaking of the pathology of infancy, he states (1) that when an acute disease attacks an infant previously healthy the intensity and the extent of the reactions are out of proportion to the malignancy of the disease. (2) When an infectious disease develops in a nursling there is danger that it will not become localized; this extension usually takes place by lymphatics, but may take place through the blood. The participation of the lymphatic system in the young is very frequent. (3) Chronic diseases of infants manifest themselves more by modifications of the general condition than by local reactions of organs of primary lesion. The chief symptoms are those of disturbances in weight, anemia and morbid reactions in the hemolymphatic system, especially of the bone marrow, which he believes is the essential cause of rickets or osteolymphatism. The most common diseases which cause these groups of symptoms are: tuberculosis, lues, defective alimentation, digestive troubles, prolonged bronchopneumonia and pyodermias. M. S. R.

GRAEF, CHARLES, M.D.: THE TONSIL PROBLEM. (Medical Times, March, 1915, p. 73.)

The writer very fully discusses the subject and says that until the question is authoritatively answered more or less radical differences of opinion must obtain. Where so many theories are presented it is likely that none contains more than a portion of the facts. The healthy tonsils undoubtedly perform a useful function, diseased tonsils just as surely tend to initiate and maintain pathological conditions. Enlightened experience should determine the cases which need operation and what plan of operation will be best. Recurrent tonsillitis, quinsy, complicating rheumatism, otitis, mouth breathing and certain rare cases of reflex disturbance all present indications for operation. In all cases operated there should be careful coaching in proper habits, as this is often of more importance than the mere removal of obstructing soft parts.

Complete removal of the tonsil is undoubtedly best and may be carried out in a number of ways, each operator suiting himself as to instruments, it being chiefly a matter of educated hands and good judgment. General anesthesia is best for children; the writer has found novocaine the best local anesthetic for older patients. In addition to the usual preparation, calcium chloride and lactate are given for a few days, as the writer feels that this surely reduces hemorrhage. W. L.

EISENDRATH, D. N., AND STRAUSS, A. A.: THE ACUTE ABDOMEN IN CHILDREN. (Illinois Medical Journal, April, 1915, p. 273.)

The authors report a number of very interesting cases from the Michael Reese Hospital in Chicago. They divide the acute abdomen in children into the following groups: (1) Appendix, (2) Liver, (3) Intestines, (4) Peritoneum. Cases are described from all groups. One is very apt to be led astray by the softness of the abdomen in some cases of generalized peritonitis. Tympany appears early and is more pronounced in children both in inflammatory and in obstructive conditions than in adults. The white blood count is often the most puzzling symptom. The authors have seen a leukocytosis of 30,000 to 40,000 and have found only an intensely injected appendix. On the other hand, a perforated appendix with peritonitis often showed a very low blood count—between 9,000 and 11,000—especially if there was little resistance due to extreme sepsis. The authors call attention to the fact that there is at times a difference of 2 to 3 degrees between the mouth and rectal temperature. Temperature should always be taken by rectum in children. J. S. L.

Fraser, John, M.D., M.Ch., Edin.: The Treatment of Umbilical Hernia in Children by the Subcutaneous Elastic Ligature. (Lancet, September 27, 1913, p. 925.)

The use of simple mechanical measures, while successful in many cases, has two disadvantages—uncertainty and tediousness. Considerations such as these led to the employment of the method outlined. The patient must be at least six months old and preferably over one year, the hernial opening should not be larger than to admit tip of the little finger, and it is necessary that the sac be empty, although its size is of no concern. The operation requires but a couple of minutes. The skin over the fundus of the sac is grasped with forceps and gently lifted up, three small incisions are made at equal intervals around the periphery of the sac where the skin is reflected to the abdominal wall. These penetrate the subcutaneous tissue, but must not injure the sac. With a blunt dissector the tissues are undermined from one incision to another and a one-eighth inch elastic cord three inches long drawn around the pedicle. After making sure that the sac is empty the ligature is drawn as tightly as possible and secured with a stout piece of silk, the protruding ends cut to a convenient length and a simple dressing applied with adhesive plaster. The ligature is removed after six days and with simple dressings the opening quickly heals. The results have been uniformly successful. One child developed whooping-cough two days after the operation, but had no recurrence of the protrusion. W. L.

Brundage, Frank E., M.D.: Dietetic Malnutrition in Infants and Its Treatment. (New York State Medical Journal, March, 1915, p. 108.)

The writer refers to the new classification of digestive diseases as due particularly to the work of Finkelstein and Meyer, and asserts that malnutrition is a secondary condition and not a disease. It occurs twice as often in the bottle-fed. The prolonged use of proprietary foods, the careless or unskilled use of cow's milk and defective quantity or quality of breast milk are the chief causes. He employs three gradations for his cases—the mild cases in the breast-fed, which are about 2 pounds light and usually quite uncomfortable; the moderately severe cases among the bottle-fed which should always be gradually transferred to adequate feeding, as a few days of moderate hunger are preferable to haste and disaster; the third class of cases shows constant loss of weight, anemia, relaxed tissues, emesis or diarrhea, and prolonged distress; these cases are very trying. The change from one food to another should usually be gradually carried out; too long a period of starvation may be positively injurious. The use of a simple dilution of cow's milk with sugar water is advised, beginning with 1 ounce milk and 2 ounces sugar water and gradually increasing the milk to 6 ounces, keeping the diluent constant. The number of feedings should fall from ten in the first month to four after the eighth month. Fresh air and general management are about as important as the food. Proprietary foods are the greatest sinners in the bottle-fed and ignorance in the breast-fed. A fair knowledge of milk, skim milk, whey, buttermilk and albumen milk will enable the general practitioner to successfully treat these cases. W. L.

APERT, E.: TUMEFACTION OF THE BREASTS AND SECRETION OF MILK IN NEWBORN INFANTS. (Le Nourrisson, September, 1914.)

The tumefaction begins on the third or fourth day after birth and it attains its maximum enlargement in a few days; both the secretion and the enlargement tend to decrease at the ninth day, but at times are apt to persist until the twentieth day. In certain infants both the tumefaction and the secretion of milk are much more marked later; the breasts become not only large, but also hard, red and painful. The secretion of milk in these cases is quite plentiful and in a few minutes about 10 c.c. of milk can be expressed; the milk resembles that from a wet nurse in full lactation. Local infections at times occur, as in women. This is mostly due to the prevalent custom of expressing the milk from the breasts, it is commonly known among the laity as witches' milk (lait des sorcières") and is considered to be a poisonous and injurious humour.

The first scientific studies of this phenomenon were made by Natalis Guillot (1853). Chemical analysis of such milk by Gubler and Quévenne showed it to be composed as follows: Fat, 14; casein, 28; lactose, 64; water, 894. Variot and Lecoq give the following figures: Fat, 14-15; casein, 11-25; lactose, 42-46. The writer's analysis of such milk showed that the fat, the casein and the milk sugar compares favorably with that of mother's milk, but that the salts are found in greater quantities in infants' milk; thus the phosphates in infants' milk were:

P^2O_5—0.844; PO_4Na_2H—1.688; Cl—0.994; NaCl—1.638; in mother's milk: P^2O_5—0.468; PO_4Na_2H—0.946; Cl—0.445; NaCl—0.773. Microscopic examination is same in both. After fixation in alcohol and ether and coloring in hematoxylin-eosin, one sees a few leukocytes and occasional colostrum corpuscles. When the milk is more plentiful it is more rich in water, less rich in fat, proteid and lactose.

"In resumé, one observes in the milk of the newborn variations absolutely analogous to those which one sees in the milk of a nursing woman." Mallet, Camerer and Barrier have observed vulvar hemorrhages in connection with tumefaction of the breasts. Ollivier has made a study of these cases and considers this phenomenon "a prelude to the establishment of precocious puberty." Many other theories have been suggested, but without any scientific basis. In males, enlargement of the breasts occurs in conjunction with hypertrophy of the genital glands and accelerated spermatogenesis; there may be serous effusion in the tunica vaginalis. On the whole, one observes in certain newborn infants anatomic and physiologic modifications comparable in all respects to those which manifest themselves at time of puberty. M. S. R.

Robertson, L. Bruce, and Brown, Alan: Blood Transfusion in Infants and Young Children. (The Canadian Medical Association Journal, April, 1915.)

The authors review the literature on blood transfusion and point out the different conditions in which it is of use and importance. They make use of the von Ziemssen method, improved by Lindemann and modified by themselves. The instruments used are a set of six 20 c.c. ground-glass syringes, four Luer needles, some of which have smooth, unbevelled tips; two two-inch rubber tubes armed with metal tips fitting the syringe and needle, respectively, and a set of small dissecting instruments—the last named to be used when a superficial vein of the recipient cannot be entered by puncture through the skin.

The following is a synopsis of the cases: (1) Hemorrhagic disease, complete recovery in 4 cases. (2) Secondary anemia. (*a*) Simple: 4 cases, all recovered; hemoglobin, from 27 to 82. (*b*) Chronic tuberculosis infection: 6 cases, 1 recovered; hemoglobin, from 32 to 76. (*c*) Empyema: 2 cases, 1 recovered; hemoglobin, from 40 to 85. (*d*) Congenital syphilis: 1 case, died. (3) Sarcoma: 1 case died; hemoglobin, from 19 to 90. (4) Von Jaksch's anemia: 1 case died; hemoglobin, from 45 to 55. (5) Leukemia, 5 cases, all died; hemoglobin, from 22 to 81. (6) Marasmus: 2 cases, both recovered. Hemoglobin, from 68 to 100. (7) Hemophilia: 1 case, bleeding stopped, much improved; hemoglobin, from 20 to 98.

Two detailed cases follow—one intestinal hemorrhage and the other pyloric stenosis.

The following conclusions were reached: (1) Transfusion is a safe and not complicated procedure. (2) The danger from hemolysis is over-rated and the injection of small air bubbles in our experience has created no ill effects. (3) In all cases the immediate effect is beneficial; the ultimate outcome depends on the original condition. (4) The best results in our experience have been obtained in hemorrhagic disease of the newborn, simple secondary anemia and marasmus. H. R. M.

BECK, OSCAR: MENINGITIC SUPPURATIVE EXTRADURAL ABSCESS OF THE POSTERIOR FOSSA OF THE SKULL AFTER PURULENT TONSILLITIS. (Annals of Otology, Rhinology and Laryngology, March, 1915, p. 25.)

The following case seems to be a unique one and the literature gives but one other example:—

A child of seven years, with no history of a previous illness, suddenly became ill on the night of April 10th, with high fever, great restlessness, crying out, persistent vomiting, headache and dizziness. There was complete paralysis of the left facial and abducens nerves with nystagmus toward the right and diminished hearing in the left ear. The child was admitted to the hospital, walking there with its father, on April 21st, and at this time the temperature was 101.5°; severe headache and dizziness were present. Except for the nerve symptoms mentioned above, the neurological examination was negative. The clinical picture remained unaltered for three days when the temperature rose to 104°, and on April 25th the condition became very critical; Cheyne-Stokes respiration of thirty per minute; no reflexes. Lumbar puncture showed cloudy fluid with many streptococci. The autopsy findings were: old right-sided purulent tonsillitis; fresh left-sided purulent tonsillitis; large retropharyngeal abscess; large abscess cavity in the bones at the base of the skull with pachymeningitis about the sella turcica. From detailed examinations of the skull the course of the infection could be followed from the tonsils and the first symptoms began when the abscess broke through the floor of the skull. The duration of the entire illness was two weeks. S. W. T.

STARK, H. H.: TWENTY-FIVE CASES OF VINCENT'S ANGINA SUCCESSFULLY TREATED WITH SODIUM PERBORATE. SPECIAL REPORT OF THREE CASES. (Annals of Otology, Rhinology and Laryngology, March, 1915, p. 48.)

The author's attention was directed to this remedy by a dentist who was using it for Vincent's angina of the gums. The perborate should not be confounded with the biborate of soda or borax. The perborate splits up in the mouth, forming nascent peroxide of hydrogen and is prescribed in a solution of two teaspoonfuls to a glass of water and used as a mouth wash and gargle. It relieves pain within twenty-four hours and regularly cures in a short time. If the author's results with this remedy can be repeated in all cases we have a most simple and valuable means of combating a lesion which at times is most serious and often overlooked and mistaken for other conditions. S. W. T.

BORDEN, CHARLES R. C.: SYSTEMIC INFECTION OF MIDDLE EAR ORIGIN IN THE EXANTHEMATA. (Annals of Otology, Rhinology and Laryngology, March, 1915, p. 1.)

Measles has been proven to be a bacteremial disease, but whether toxins are produced is as yet unknown; toxins are well demonstrated in diphtheria; in scarlet fever a toxemia has not been established and its most striking characteristic is the lack of immunity against streptococcus infection. This lack of immunity extends well into the period of convalescence and almost any organ in the body may become the seat of infection. In scarlet fever, complications in any of the vital organs may be very much increased if middle ear infection become an added focus to the production of toxins. The author reports several cases in support of this statement as occurring in children between the ages of three and eleven, where it was necessary to perform a prompt mastoid operation and where, when this added complication was eliminated, the patients recovered. He had never seen any bad results following the necessary use of ether for anesthesia, even where the kidneys had been involved or even in cases of pneumonia. S. W. T.

FLEXNER, SIMON: THE MICROBIC CAUSE AND MANNER OF INFECTION OF POLIOMYELITIS. (Bulletin of Johns Hopkins Hospital, May, 1915, p. 180.)

This paper is an elaboration of the paper which appeared in the Journal of Experimental Medicine, January, 1915, by Dr. Flexner, and it might not be amiss to repeat some of the things which were brought out in that paper. The cultivation of the microbe which causes poliomyelitis grows best in a medium consisting of a fragment of kidney tissue and ascitic fluid under anaerobic conditions in a manner similar to that employed by Noguchi for the cultivation of the parasitic spirochetæ. The microörganism cultivated from poliomyelitic tissue differs completely from the spiral organism and appears as a globular or oval body of an extremely minute size. It has been found that of the different cultures of the microörganisms obtained only a few were capable of causing experimental poliomyelitis upon inoculation, the greater number proving inactive and non-pathogenic. Several tubes containing a pathogenic strain in the second generation were put aside for a year and at the expiration of the time the microörganism was still living. This indicates its strong resisting power and long life. Dr. Flexner believes that the effective agent of poliomyelitis is disseminated by persons and not by insects. He believes, however, that there is no question but in a few instances experimental poliomyelitis has been conferred by means of the bite of a stable fly. Experiment proves that under some circumstances the blood contains the virus which can be removed from one animal and injected into another by means of an insect. Howard and Clarke have shown that the bedbug also can move blood containing virus from inoculated monkeys, but it proved impossible to induce paralysis by permitting the bedbug thus infected to feed upon normal monkeys. Dr. Flexner believes, however, that the microbe of poliomyelitis is carried by persons, not by insects. R. D. M.

REED, A. L.: THE PROBABLE CAUSE AND LOGICAL TREATMENT OF EPILEPSY. (The Ohio State Medical Journal, June 15, 1915, p. 377.)

The author believes that epilepsy is the result of a specific toxemia and that the duodenum is the seat of elaboration of the toxin; that constipation of a mechanical nature exists in all epileptics and should be corrected by surgical measures. Ileosigmoidostomy is first done to overcome the constipation and later colectomy to remove the resulting stagnation. The symptoms of epilepsy are given in detail and comparisons made to show the close relationship of epilepsy to known states of bacillary toxemia. Preliminary bacterial studies of the blood have impressed the author that the principle of immunization might be applied to advantage. Two cases are cited in which after ileosigmoidostomy status epilepticus developed and vaccines made from the blood were given with gratifying results. Through surgical correction of the mechanical constipation and the use of vaccines the author believes a new field has been opened for the treatment and cure of epilepsy. E. F. W.

PONTOPPIDAN, H.: PROGNOSIS IN SUPPURATING CHRONIC OTITIS IN INFANCY. (Ann. de Med. et Chir. Inf., 1914.)

The duration of a chronic suppurated otitis depends chiefly upon anatomical formation of the parts. A large antrum would favor the collecting of pus and thus hasten the process of necrosis which necessarily follows such a damming up. An early opening of the antrum appears to be the only rational procedure.

C. D. M.

FRANÇOIS, J.: ACUTE OSTEOMYELITIS OF THE SUPERIOR MAXILLA IN INFANCY. (These de Paris, 1914.)

Osteomyelitis is not at all infrequent in the first two years of life, and, moreover, has been seen even in nursing infants. The infection of the dental germ takes place by direct contact with septic material in the genital tract and is further aided by traumatism at birth. After an exhaustive study of the differential diagnosis of the disease François concludes that the only cure consists of free drainage after exposing the infected area by surgical means. C. D. M.

FORCE, JOHN NIVISON: THE HOW AND WHY OF VACCINATION AGAINST SMALLPOX. (Northwest Medicine, September, 1915, p. 278.)

After explaining the principles of immunity as they apply to vaccination against smallpox, Force says that we should not recognize vaccination failures. If a fresh virus which has been kept on ice in the vaccine establishment, shipped in a thermos bottle and again stored in the ice-box until used, has been employed it should give 100 per cent. of successful vaccination in persons who have never been previously vaccinated. Failure to produce results means only one thing—inert virus.

He gives eleven rules for vaccination, from which the following may be quoted:—

Do not vaccinate with a tube of virus ordered by telephone from the nearest drug store, unless you know that the druggist keeps his stock of biologic products on ice and is careful to renew them within the expiration dates stamped on the packages.

Do not cross scarify the arm, but use a needle, making two single scratches about ¾ inch long, and 1 inch apart, or better still, use a small chisel with a rotary motion, removing three small circles of epidermis about ⅛ inch each in diameter.

Do not issue a certificate that you have used due diligence and cannot secure a successful vaccination. If you think that the person ought to be immune, look for the immunity reaction within twenty-four hours after the vaccination. If you think the person is not immune, use fresh virus. Something *has* to happen.

Do not forget that the reaction of immunity is a sign of successful vaccination. Evidence of immunity is all that we are striving for and a sore arm is not necessary to prove it.

Do not forget that inert virus may contain the necessary proteins to give the reaction of immunity. If you doubt the virus try it on a previously unvaccinated person. R. B. M.

YERINGTON, H. H.: DIAGNOSIS OF CONGENITAL SYPHILIS. (California State Journal of Medicine, September, 1915, p. 341.)

This is a brief review of four years' observations, especially as regards the Wassermann reaction as a diagnostic aid. Because of the sources of error in this reaction, of which the most important source is faulty technique, Yerington has employed the cerebrospinal serum test and found it in many cases more delicate than the Wassermann reaction.

Because of our lack of knowledge as to the meaning of a negative serum test, and because of the fact that any errors in the tests are on the positive side so that children are pronounced syphilitic when they are not so, it is hard to come to any definite conclusion on the value of a positive serum test.

He speaks of the difficulty of obtaining a negative test after a positive one has been obtained. In infants at birth and under a year, fewer doses of salvarsan have to be given to produce a negative result than in older children. After the first year the syphilitic virus seems to be more persistent and the doses have to be repeated oftener to cause the serum to become negative.

In the cases under review it was not as easy to clear up active lesions or to get a negative serum report as quickly with mercury as with salvarsan. R. B. M.

PECK, CHARLES H.: FETAL ADENOMA OF KIDNEY. (Annals of Surgery, June, 1915, p. 748.)

Peck's case was presented at a meeting of the New York Surgical Society. A little girl, not quite four years of age, complained of abdominal pain for about three months before the swelling of the right side of the abdomen was noticed. The child was emaciated, but otherwise normal, except for a tumor the size of a grape fruit in the right kidney region. Two months later, when the parents finally consented to operation, the child had become greatly emaciated and the tumor was enormous. Anemia was marked and the superficial veins of the abdomen were dilated. The hemoglobin was only 39 per cent. Operation seemed hopeless, but was finally undertaken. Great difficulty was experienced in enucleating the mass, but it was at last accomplished and the child made an uninterrupted recovery. She has gained in weight and strength.

During the discussion of this case Dr. William A. Downes stated that he had removed 9 of these tumors and that 4 of the children had died as a result of the operation, 4 later on from recurrence, while 1 only was alive and this only two months after operation. C. E. F.

FISCHL, R.: CYSTITIS IN CHILDREN. (Journal of American Medical Association, June 26, 1915, p. 2,173.) (Abstracted from Prager Med. Woch.)

Cystitis in children is a rather rare condition. Fischl only found 26 cases in 15,000 children under one year of age examined in his service, and 15 more in his private practice. Only 5 were in boys. The diagnosis is frequently overlooked or the condition is mistaken for enteric fever. The course is apt to be protracted in the neglected cases. The treatment is hexamethylenamin in 0.5 gm. doses daily for young infants, persisted in until the urine is normal, usually about a week. After two weeks the treatment should be discontinued if improvement is not noted and the bladder irrigated with permanganate or silver nitrate solutions. Autogenous vaccine in 1 case of colon bacillus infection cleared up the condition, which had failed to yield to the regular treatment. C. E. F.

RODMAN, J. S.: NEPHROLITHIASIS IN CHILDHOOD. (Annals of Surgery, April, 1915, p. 506.)

Rodman's case was in a boy of twelve years with bilateral stones. Operations were performed on the two kidneys at different times, as the shock was considerable. One large stone was found in the right and one large and two small stones in the left kidney. Convalescence was stormy but recovery complete. The noteworthy feature of the case was the absence of renal colic. The only symptoms were headache and hematuria.

Nephrolithiasis in childhood is rare. It seems to occur more frequently in some localities than others and various factors of heredity, such as gout and defective metabolism, are of considerable etiologic importance. He quotes from Rafin's statistics of 35 cases, of which 24 were boys and only 11 girls, while in the Mousseaux series of 77 cases there were 51 boys to 26 girls. In Neupaner's 100 cases only 5 were in females. The X-ray is the only reliable means of diagnosis, but even this is deceptive, as some stones cast very little shadow. C. E. F.

HIRCHBERG, LEONARD KEENE: THE AFTER TREATMENT OF INFANTILE PARALYSIS. (The Medical Standard, July, 1915, p. 279.)

The importance of hot baths in the treatment of infantile paralysis as soon as the paralysis has developed is strongly emphasized. At least once, and, if possible, three times, daily and once during the night a deep bath is given. The temperature of the bath should be 100°F, gradually increased to 104°F. The duration of the bath is fifteen minutes and the nurse supports the head of the child while in the water. The child is encouraged to use the paralyzed extremities. Besides the baths all sorts of games involving the use of hands and feet are devised. The ideal place for convalescence of these cases is in the country or at the seashore, where climbing and outdoor exercises can be indulged in. The routine employment of massage and galvanism are mentioned. E. F. W.

MARTINEZ VARGAS, A.: DIPHTHERIA IN PEDIATRIC CLINIC IN BARCELONA. (La Medicina De Los Ninos, 1913, No. 166.)

An epidemic of diphtheria brought to the Pediatric Clinic 27 cases, 19 of which were of the larynx, 7 of the pharyngeal tract, and 1 a primary affection of the conjunctiva. All these received antitoxin and the mortality was *nil*. In laryngeal cases Martinez Vargas always prefers intubation to tracheotomy. The results obtained in this series of cases show that practically all cases of diphtheria properly cared for are curable. C. D. M.

TULEY, HENRY ENOS: HEART DISEASES IN CHILDHOOD. (The Louisville Monthly Journal of Medicine and Surgery, July, 1915, p. 15.)

Emphasis is placed upon the absence of typical adult symptoms in children. Murmurs may be present for only a few hours at a time and may occur between visits. The X-ray is valuable in diagnosing dilatation of the pulmonary artery, aneurism of the aorta and pulmonary artery and of pulmonary stenosis. Dunn's review of the diagnosis of congenital diseases is well condensed in this article. Attention is called to the great frequency of myocardial inflammation without endocardial involvement. Pericarditis (primary) is rare from the second to the seventh year. Irregular temperature in cases of rheumatism is indicative of endocardial involvement. Palpitation, syncope, cyanosis and pain or distress over the precordium are present in myocarditis. Sometimes there are but few subjective symptoms noticed in endocarditis. Too much exercise may be a possible cause of heart disease in childhood. Blood-pressure estimation in childhood, especially under five years of age, is not of great clinical assistance. The plethysomograph and polygraph are mentioned as possible aids in diagnosis. Prognosis is entirely an individual problem. Dunn states that the immediate mortality of rheumatic cardiac diseases in childhood is 20 per cent.; subsequent mortality of rheumatic endocarditis followed for at least ten years 60 per cent. The age of puberty exerts a special tax upon childhood, the subjects of endocardial inflammation. The earlier the endocarditis the better the prognosis.

As to treatment, the tonsils should be removed if there is an existing endocarditis and also if there is a history of recurrent attacks. Rest for six weeks or more conjoined with massage and passive motion are the most important measures. Buccal infections, such as Rigg's disease, should be eradicated. The ice bag for periods of half an hour over the precordium is a great relief for pain and dyspnea. Salicylates are recommended for the rheumatic manifestations. Digitalis and strophanthus in small doses are used at the first signs of failing or ruptured compensation. E. F. W.

BOOK REVIEWS

DIETETICS; OR, FOOD IN HEALTH AND DISEASE. By WILLIAM TIBBLES, LL.D., M.D. (Hon. Causa), Chicago; L.R.C.P., Edinburgh; M.R.C.S., England; L.S.A., London; Medical Officer of Health; Fellow of the Royal Institute of Public Health, etc. Pages 627. Philadelphia and New York: Lea & Febiger, 1915.

This is one of the most useful books that has come before us. A little less austere than some of the works on metabolism, it is yet quite as faithfully scientific. It aims to lay a foundation for the prescribing of food on the metabolism of the individual and the pathology of the disease. There are excellent chapters on the digestion and absorption of foods, the amount of food required in many circumstances, the feeding of infants and children, and a particularly helpful chapter on the vitamines and deficiency diseases. In all respects, it is a book to own.

SIMPLIFIED INFANT FEEDING WITH SEVENTY-FIVE ILLUSTRATIVE CASES. By ROGER H. DENNETT, B.S., M.D., Adjunct Professor of Diseases of Children; New York Post-Graduate Medical School; Attending Physician of the Children's Department, New York Post-Graduate Hospital; Assistant Attending Physician at the Willard Parker Hospital and the Red Cross Hospital, New York. Pages 355, with 14 illustrations. Philadelphia and London: J. B. Lippincott Company, 1915.

This newcomer to the ranks of the books which aim to make "the busy practitioner" an adept in the rearing of babies by hand, comes in an attractive guise, and makes use of an interesting method of instruction, namely, the detailed case history. This method is always a good one to gain the attention of the reader, but is likewise open to the charge, harder to refute in regard to feeding cases than most others, that the diagnosis is not established and that the method of treatment may not be the one indicated or the only one indicated. Dr. Dennett's book, too, by being a "simplified" book has a somewhat limited field. The simplification consists chiefly in the use of whole milk mixtures almost exclusively and the insistence upon certain rules as to amounts of sugar and proteid, which the author has come to consider absolute. Some of the simplification consists in eliminating some of the methods used by other authorities in adapting cow's milk for the digestion of infants, as in the matter of proteids, where whey mixtures, lime water, alkalies, gruels and peptonizing are said to be discarded, and that boiling the milk is all that is necessary and has supplanted other methods. In the chapters on the treatment of diarrhea, the characteristics of explicitness and detail of instruction are well in evidence; and the amount of space devoted to breast-feeding and its management more nearly proportioned to its importance than in most books. There is a chapter giving the prices and methods of use of sixteen proprietary foods. It will be a great satisfaction to the many post-graduate students who have profited by Dr. Dennett's oral teaching to have in concrete form ready for reference at any time such a complete and adequate exposition of his ideas.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE. By HOBART AMORY HARE, B.S., M.D., Professor of Materia Medica and Therapeutics in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; One-time Clinical Professor of Diseases of Children in the University of Pennsylvania. Third edition, revised and enlarged. Illustrated with 142 engravings and 16 plates in colors and monochrome. Pages 696. Philadelphia and New York: Lea & Febiger, 1915.

Little need be said of Dr. Hare's book, already so well known in its earlier editions save that the necessary work of bringing the text up to the advances made in medical knowledge since the publication of the second edition has been done with excellence and completeness. The book is quite up-to-date, attractive and very readably written. It makes, therefore, a very satisfactory volume, whether used as text-book or book of reference.

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ORIGINAL COMMUNICATIONS

STUDIES IN GONOCOCCUS VAGINITIS *

I. THE METHOD OF VAGINAL WASHING IN THE DIAGNOSIS OF GONOCOCCUS VAGINITIS

BY MARY E. TRIST
AND
JOHN A. KOLMER, M.D.

It is the general consensus of medical opinion that the majority of cases of vulvovaginitis of children are caused by the gonococcus of Neisser and that all cases should be so regarded until proven otherwise.

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* From the Laboratories of the Philadelphia Polyclinic and College for Graduates in Medicine. Part of the paper read before the New Jersey State Pediatric Society on Monday, June 21, 1915. The balance of this paper on immunological studies in gonococcus vaginitis will be published at a later date.

The diagnosis of this infection during the acute stages may be made by clinical examination and relatively simple bacteriologic procedures. The diagnosis of chronic and latent infections is far more difficult and these cases are of great importance from the standpoint of being carriers of the micro-organism capable of spreading the infection to other children, particularly in hospital wards and institutions.

In the group of chronic and latent infections the clinical manifestations may be so slight as to escape detection and the bacteriologic diagnosis by stained smears may be and is, in the majority of cases, a difficult and responsible task and not infrequently yields indefinite results, either in a positive or negative way. The same difficulties are usually encountered in cases under treatment when it becomes necessary to determine whether or not a patient may be considered cured and free from gonococci. In these the external genitals may appear normal and a series of bacteriologic examinations by ordinary smears fail to show gonococci, while the child may harbor the micro-organism and prove infectious when placed among healthy children. Because of these difficulties any procedure that aids in the bacteriologic examination and diagnosis of these must be of value and particularly if the method is relatively simple and adapted to the use of the practitioner.

The method suggested by Van Gieson[1] of determining the presence of the gonococcus by examining the centrifuged washings of the vagina is of distinct value and fulfills the requirements of simplicity and adaptability to practice and routine work. One of us (Kolmer) was made acquainted with this method several years ago by Dr. S. McC. Hamill, in whose out-patient and house services in the Polyclinic Hospital the method has been in constant use.

Several features of specific vulvovaginitis in children are indeed striking—as its extreme infectiousness, the inexplicable means by which it not infrequently appears among children and the great tendency to run a prolonged course despite treatment and finally disappear spontaneously as the child approaches puberty. It would appear that distinct races of gonococci may be responsible for the disease in children and the work of Louisa Pearce[2] indicates that this may be the case as based mainly upon the results of a comparative study of various strains of gonococci from adults and female children by the immunological methods of agglutination and complement-fixation.

In a study of gonococcus vulvo-vaginitis with particular reference to the development of methods for bacteriologic diagnosis and to determine the relation of the gonococci of these infections to those causing similar infections in adults, as investigated by Pearce, we have paid particular attention to this method of diagnosis by vaginal washing, the results from the standpoint of practical work being given in this paper.

BACTERIOLOGIC DIAGNOSIS OF GONOCOCCUS VULVOVAGINITIS

While it is well known that the diagnosis of gonococcus infections by microscopic examination of stained smears is open to error, yet this method remains the only practical and simple procedure for routine work. The isolation and cultivation of gonococci particularly from the scanty discharges of chronic cases remains a difficult procedure. With suitable culture media cultures of diplococci which stain Gram negatively and resemble the gonococcus morphologically are secured without undue difficulty but a strict identification of these especially by serological methods shows them to be other than gonococci in a large percentage of cases.

It is well known that Gram negative diplococci bearing some resemblance to gonococci may be found in the vaginal flora of healthy and normal children. Usually these diplococci are extracellular. Belonging to this group is the micrococcus catarrhalis, which is not infrequently mistaken for the gonococcus not only in direct smears but also in cultures.

Gonococcus infections are usually accompanied by a rich outpouring of leukocytes. In chronic cases this discharge may not be detected in smears of the vulva and vaginal introitus, but is to be found within the vagina and about the cervix. This explains in brief the success of the method of vaginal washing, which, when properly performed, secures these cells and in this manner aids greatly in diagnosis.

Before the diagnosis of gonococcus infections by direct examination of smears may be made we insist upon finding a number of leukocytes above the normal and intracellular Gram negative diplococci. Little or no attention is paid to extracellular diplococci, regardless of their being Gram negative and closely resembling the gonococcus in morphology, if there are no polynuclear leukocytes present or if these are within normal limits. Diplococci with these qualities may be found in smears of the majority of healthy children and adults and while they may mislead when found intracellularly, they may be disregarded when extracellular and especially if there is no increase in the number of leucocytes. These remarks apply, however, to the bacteriologic diagnosis of chronic cases of vulvovaginitis and cases under treatment; smears of the pus from acute cases abound in pus cells with intracellular and extracellular gonococci and are easy of diagnosis.

Of great importance in the diagnosis of gonococcus infections is good and perfect staining by the method of Gram. While smears may be stained with methylene blue and a safe diagnosis made on the basis of numerous phagocytes containing numbers of typically shaped diplococci, yet it is unsafe to routinely make diagnoses with this one stain. We have repeatedly found cases of vulvovaginitis in which smears stained with metheylene blue have shown pus cells containing diplococci while with Gram's stain these have been found to be Gram positive. With the methylene blue stain alone these may easily be mistaken for gonococci.

Briefly, then, in the bacteriologic diagnosis of gonococcus vulvovaginitis by direct examination of smears of the diseased parts or of the sediment secured by vaginal washing we wish to emphasize the importance of perfect Gram staining and the presence of an increased number of polynuclear pus cells in some of which patient search will disclose Gram negative diplococci. The presence of many pus cells without any being found to contain Gram negative diplococci should be regarded as "suspicious" and the child regarded as being infected with the gonococcus until proven otherwise by a series of examinations. When the same preparation shows only an occasional leukocyte with no intracellular diplococci and with numerous epithelial cells we regard that smear as being free of gonococci. Under these conditions but slight attention is paid to extracellular diplococci because of our inability to differentiate between gonococci and micrococcus catarrhalis and other Gram negative diplococci by morphological and staining characters alone.

RATIONALE OF THE METHOD OF VAGINAL WASHING IN DIAGNOSIS

As described by Rubin and Leopold[3] and Sinclair[4] the vaginal mucosa may show considerable involvement in gonococcus infections with collections of pus, particularly about the cervix. We have on numerous occasions found superficial ulceration of portions of the vaginal mucosa with considerable pus in the vagina and about the cervix when the vulva and vaginal introitus were but slightly involved and were able to generally confirm the findings reported by these observers.

In young children and infants particularly the appearance of the vulva and vaginal introitus may be no index of the extent of the disease as shown by direct inspection of the vagina and cervix.

Washing the vagina with an isotonic solution removes a large portion of the secretions and when the washings are centrifuged, the pus and epithelial cells and micro-organisms are secured in the sediment from which smears may be prepared and stained for microscopic examination.

The method of vaginal washing, therefore, has its greatest value in the diagnosis of chronic cases and cases under treatment, and depends upon securing pus and secretions from the vaginal canal, where the disease may lurk for long periods of time. Washings are likely to secure the maximum number of leukocytes, and, as stated, the number of these present and examination of them for intracellular diplococci aid greatly in the bacteriologic diagnosis.

TECHNIC OF VAGINAL WASHING

The technic is quite simple and in hospitals a nurse may be trained to collect the specimens. It is necessary to actually wash out the vagina instead of washing the vulva and vaginal introitus and collecting the washings in a test tube, as we have found the method practiced in a number of instances.

1. The child is placed on her back, at the edge of a table or bed; the buttocks are elevated and held in position by an assistant.

2. The operator should protect the hands with rubber gloves.

3. The external genitals are wiped with a pledget of cotton wet with mercuric chloride solution.

4. With a sterile all-rubber eye syringe 2 to 4 drams of 1:4000 mercuric chloride in normal salt solution is injected somewhat vigorously into the vagina. If the introitus permits, the nozzle of the syringe may be inserted and gently stirred about in order to loosen the flecks of pus and secretion from the vaginal walls. The solution is now sucked back into the bulb of the syringe and expelled into a sterile test tube or centrifuge tube.

Instead of using an eye syringe, which may soon be destroyed by frequent boiling, an ordinary medicine dropper with a good rubber teat may be sterilized and used. It is necessary to balloon out the vagina with several droppers full of solution. The washings are readily collected in the glass tube and teat of the dropper and placed in a centrifuge tube. When it is necessary to collect a number of specimens, as in a dispensary or ward, a dropper for each child may be sterilized at the same time and much time thereby saved.

Usually the most favorable time of the day for securing the specimens is before the morning bath. After the specimen has been secured the prescribed treatment may be carried out at once.

Normal salt solution has yielded us better results than plain or distilled water, as the cells are better preserved and stained. Bichloride of mercury is added as a germicide for the purpose of safety; when it is desired to make cultures of the sediment the washings should be made with sterile normal salt solution alone.

5. The washings should be examined soon after collection. If allowed to stand at room temperature until the following day many of the cells will be found in advanced stages of degeneration and saprophytic bacteria may proliferate to such an extent as to interfere with the bacteriologic examination. (Fig. 4.) As a general rule, the washings should be centrifuged within an hour or two after collection and smears prepared of the sediment.

6. If the washings are quite cloudy centrifugalization for a few minutes' duration at moderate speed will suffice to throw down a sediment. It is not desirable to centrifuge too long or at too high speed, as this tends to pack the cells in dense masses. (Fig. 5.) At times the washings are water clear; these require more prolonged centrifugalization, but under any circumstances are usually poor in cells and free of gonocci.

7. After centrifugalization, the supernatant fluid is poured off and several smears made of the sediment on glass slides with a platinum loop. These are allowed to dry, fixed and stained with methylene blue and Gram's stain in the usual way. (Fig. 3.)

In suspected cases that yield negative results or as a final measure before discharge, painting the walls of the vagina with a 5 to 10 per cent. solution of silver nitrate, followed next day by a vaginal washing, may show the presence of gonococci that have not been found by other methods.* The silver solution usually causes irritation with an outpouring of leukocytes, many of which carry gonococci, and in this manner not infrequently proves a very useful procedure.

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*This method was suggested to us by Dr. Charles C. Norris, who has found it quite serviceable in a series of chronic cases.

LEUKOCYTES IN VAGINAL WASHINGS

1. *In the Vaginal Washings of Healthy Children:* As leukocytes are to be constantly found upon mucous membranes and as we have learned to lay considerable emphasis upon the importance of mere numbers of polynuclear leukocytes in the diagnosis of vaginitis and particularly gonococcus vaginitis, it was first necessary to determine the number of leukocytes to be found in the normal vagina by vaginal washing.

Children were selected mainly in out-patient clinics who presented no evidences of vaginitis and smears were made of the moisture about the vaginal introitus and of the sediment obtained by vaginal washings. After suitable staining, a count was made of 100 or more consecutive cells and the percentage of polynuclear leukocytes present obtained. This method was carried out in the entire series of cases for the purpose of studying the relation and diagnostic value of numbers of leukocytes alone in vulvovaginitis.

The results of a selected number of these examinations are shown in Table 1.

TABLE 1

SHOWING PERCENTAGES OF POLYNUCLEAR CELLS IN SMEARS AND VAGINAL WASHINGS OF APPARENTLY NORMAL CHILDREN

No.	Name	Age yrs.	Vaginal Discharge	Gonococci	Polynuclears	
					Vaginal Smears	Vaginal Washings
1	J. O.	1	None	Negative	4 %	6 %
2	J. B.	½	"	"	24 %	42 %
3	M. J.	½	"	"	12 %	52 %
4	R. B.	4	"	"	0	10 %
5	M. P.	9	"	"	16 %	12 %
6	M. C.	9	"	"	0	6 %
7	H. S.	2	"	"	0	0
8	M. L.	2	"	"	0	6 %
9	P. O.	7	"	"	0	5 %
10	E. C.	3	"	"	0	2 %

As will be readily understood, the number of leukocytes found depends somewhat upon the age of the child and the thoroughness with which the washing is done.

In practically all instances the vaginal washings of the vagina of healthy children will be returned water clear or at most contain flecks of mucus. Prolonged centrifugalization yields scanty or no sediment and when this examination is found to be composed mainly of epithelial cells, mucus and a few leukocytes with various bacteria. The number of bacteria present depends somewhat upon the cleanliness of the child and the care with which the genitalia are cleansed.

As will be noted in Table 1 the percentage of leukocytes was quite low. In Numbers 2 and 3 the number of leukocytes was quite high. Both of these washings were from children who presented some vulvar irritation due to dirt, smegma and negligence.

In practically all instances the percentage of leukocytes was higher in the vaginal washings than the vaginal smears.

As a general rule the percentage of polynuclear leukocytes in the vaginal washings of normal and healthy children under the age of ten years is 10 per cent. or less of the total cells present.

II. *In the Vaginal Washings of Children with Gonococcus Vulvovaginitis:* The results of these examinations are shown in Tables 2, 3 and 4.

TABLE 2

SHOWING PERCENTAGES OF POLYNUCLEAR CELLS IN VAGINAL SMEARS AND VAGINAL WASHINGS OF CHILDREN WITH ACUTE GONORRHEAL VAGINITIS

No.	Age yrs.	Name	Vaginal Discharge	Gonococci*	Polynuclears	
					Smears	Washings
1	6	V. B.	Profuse	Positive	92 %	100 %
2	3 mos.	M. P.	Profuse	"	94 %	100 %
3	13	S. K.	Slight	"	87 %	95 %
4	1	H. P.	Slight	"	85 %	60 %
5	1	J. V.	Slight	"	76 %	97 %
6	2½	E. W.	Slight	"	50 %	100 %
7	1	V. C.	Moderate	"	84 %	100 %
8	3	G. D.	Moderate	"	80 %	97 %
9	4	E. C.	Moderate	"	82 %	100 %
10	2½	J. L.	Profuse	"	90 %	100 %

* Gonococci present in both direct smears and vaginal washings.

In Table 3 are shown the results of examination of cervical smears. These were secured from children one year or older after cleansing the external genitalia and through a speculum and by means of a sterilized loop of platinum wire.

As shown in Table 2 of acute cases of gonococcus vulvovaginitis a high percentage of the cells in both direct smears and vaginal washings were of polynuclear leukocytes or pus cells.

In this group of cases the least difficulty was encountered in diagnosis.

In practically all instances the percentage of pus cells was higher in the vaginal washings than in the vaginal smears.

The results observed with a group of children with chronic vaginitis is shown in Table 3. In these the percentages of pus cells was generally higher than found in vaginal smears. In some instances wide differences were found, as in Nos. 5, 17 and 25. On the other hand, in Nos. 11 and 14 the percentage of pus cells was higher in direct smears of the vulvo and vaginal introitus than in the vaginal washings, both of these children being dispensary cases with improper attention to cleanliness of the vulva by the parent.

TABLE 3

SHOWING PERCENTAGES OF POLYNUCLEAR CELLS IN VAGINAL SMEARS AND VAGINAL WASHINGS OF CHILDREN WITH CHRONIC VAGINITIS

No.	Name	Age yrs.	Vaginal Discharge	Gonococci[†]	Polynuclears		Remarks
					Vaginal Smears	Vaginal Washings	
1	M. R.	2	Slight	Positive	22 %	56 %	
2	E. R.	6	None	Negative	2 %	Clear [††]	Cured
3	D. G.	7½	Slight	Positive	30 %	40 %	
4	S. H.	5	Slight	Positive	6 %	26 %	
5	S. W.	6	Slight	Irregular[*]	16 %	86 %	
6	B. T.	6	Slight	Irregular	32 %	50 %	
7	L. W.	4	Slight	Negative	0	5 %	Cured
8	C. C.	2½	Slight	Irregular	10 %	96 %	
9	R. V.	2	Slight	Positive	87 %	92 %	
10	S. C.	1	Moisture	Positive	90 %	96 %	
11	C. R.	⅓	Slight	Irregular	50 %	Clear	
12	E. R.	2½	Slight	Irregular	5 %	Clear	
13	G. T.	1	Slight	Positive	60 %	70 %	
14	M. V.	1	Slight	Positive	80 %	Clear	
15	S. H.	2	Slight	Irregular	80 %	90 %	
16	E. L.	1½	Slight	Irregular	5 %	24 %	
17	H. R.	⅓	Slight	Irregular	48 %	90 %	
18	B. S.	4	Slight	Positive	46 %	70 %	
19	R. C.	6	Slight	Irregular	48 %	52 %	
20	E. W.	7	Slight	Negative	38 %	30 %	
21	J. K.	1½	Slight	Positive	40 %	50 %	
22	E. S.	2 wks.	Slight	Irregular	70 %	60 %	
23	D. C.	4 wks.	Slight	Irregular	10 %	Clear	
24	D. S.	5	Slight	Positive	82 %	96 %	
25	P. B.	5	Slight	Positive	40 %	96 %	

[*] Irregular means that gonococci were found upon irregular occasions.

[†] Gonococci found in direct smears or vaginal washings or both.

[††] Clear means that the vaginal washing was returned water clear and contained so few cells that a reliable differential count could not be made.

Table 4 shows the results of the examination of a very interesting group of acute and chronic cases and cases under treatment of whom smears of the cervix were obtained in addition to smears of the vagina and vaginal washings.

TABLE 4

SHOWING COMPARATIVE RESULTS OF EXAMINATIONS OF GONOCOCCI AND POLYNUCLEAR CELLS IN VAGINAL SMEARS, CERVICAL SMEARS AND VAGINAL WASHINGS OF ACUTE AND CHRONIC CASES OF VAGINITIS AND CASES UNDER TREATMENT

No.	Name	Age yrs.	Vaginal Discharge	Gonococci			Polynuclears			Remarks
				Vaginal Smears	Cervical Smears	Vaginal Washings	Vaginal Smears	Cervical Smears	Vaginal Washings	
1	R. B.	2½	Slight	+	+	+	53 %	62 %	93 %	Chronic
2	E. T.	10	Slight	—	+	+	5 %	94 %	82 %	"
3	T. M.	3	Slight	+	—	+	82 %	88 %	98 %	"
4	E. P.	1	Profuse	—	—	+	10 %	88 %	96 %	Acute
5	E. K.	3	None	—	—	+	10 %	15 %	20 %	Treatment
6	T. F.	3	Profuse	+	+	+	92 %	94 %	96 %	Acute
7	E. C.	4	Slight	+	+	+	12 %	93 %	90 %	Chronic
8	M. P.	4	Slight	—	—	—	32 %	42 %	70 %	"
9	J. B.	3	Profuse	+	+	+	30 %	70 %	80 %	Acute
10	D. P.	5	Slight	+	+	+	56 %	57 %	66 %	"
11	M. S.	5	None	—	—	0	28 %	76 %	0	Cured
12	L. P.	2	Profuse	+	+	+	96 %	100 %	100 %	Acute
13	R. G.	9	Slight	—	—	0	50 %	98 %	0	Chronic
14	E. P.	8	Slight	+	+	+	92 %	96 %	98 %	"
15	J. K.	2	None	—	—	0	2 %	68 %	0	Treatment
16	J. V.	11½	None	—	—	0	10 %	60 %	0	"
17	M. T.	8	None	—	—	—	10 %	80 %	80 %	"
18	E. G.	5	None	—	—	+	92 %	90 %	95 %	Chronic
19	S. C.	11½	None	—	—	0	10 %	10 %	0	Cured
20	M. F.	1	Profuse	+	+	+	92 %	92 %	100 %	Acute
21	E. S.	1	Slight	+	+	+	87 %	96 %	97 %	Chronic
22	M. V.	1	None	—	+	+	80 %	88 %	80 %	Treatment
23	H. P.	1	None	—	—	—	5 %	5 %	10 %	Cured
24	M. I.	5	None	—	—	—	10 %	50 %	75 %	Treatment
25	A. E.	4	None	—	—	—	10 %	50 %	50 %	"

In general the percentage of pus cells in smears of the cervix was much higher than in the direct vaginal smears and approached the percentage of cells found in the vaginal washings. In a few instances, as in Nos. 11, 13, 15 and 16, the pus cells found in the cervical smears were far in excess of those found in the vaginal washings and these results can only be explained on the basis of faulty technic in washing the vagina, the tenacious pus about the cervix not being secured.

In practically all instances the percentage of pus cells in smears of the sediments of vaginal washings was higher than in the vaginal smears and in those few cases where the idea of cure was tentatively entertained the percentage of pus cells was 10 per cent. or less of the total number present.

GONOCOCCI IN VAGINAL WASHINGS

As previously stated, the results in this report are based upon bacteriologic diagnoses made upon finding intracellular diplococci of more or less typical morphology and staining distinctly Gram negatively.

In acute vaginitis accompanied by the usual profuse discharge of pus, the method of vaginal washing did not prove superior to the usual direct smears in diagnosis; indeed in our experience the disadvantages of vaginal washings render this method less valuable than direct smears in any case where the discharge of pus is free or moderate.

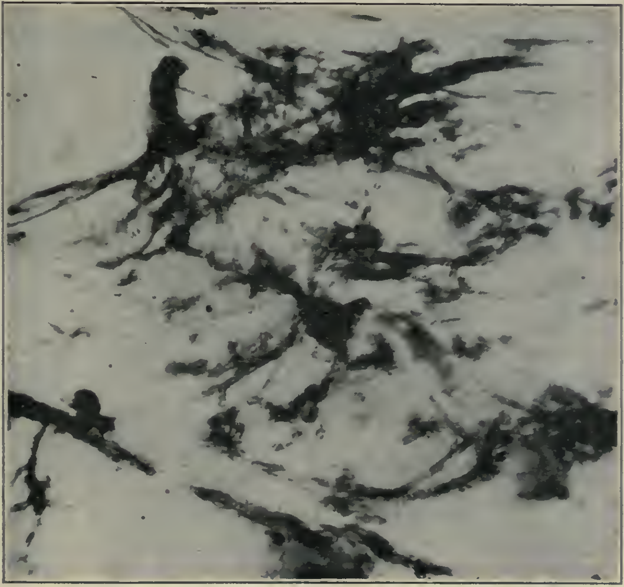

Fig. 1. Direct smear of the secretions from the vaginal introitus of a case of chronic gonococcus vaginitis. Considerable mucus is present, with few and scattered cells. Gonococci are not present in this smear. Child aged 4 years.

In subacute and chronic cases of vulvovaginitis where the discharge is scanty vaginal washings will disclose gonococci in from 20 to 25 per cent. of cases where direct smears are negative. This percentage is sufficient for rendering the method of vaginal washing of value in the diagnosis of these cases and as a control on treatment; the percentage of positive findings is increased after chemical irritation and the two together render this method of still greater value in the diagnosis of chronic gonococcus vaginitis.

COMPARATIVE VALUE OF THE METHOD OF VAGINAL WASHING AND SIMPLE SMEARS IN THE DIAGNOSIS OF GONOCOCCUS VAGINITIS

As shown in the accompanying tables vaginal washings usually disclose a higher percentage of pus cells in vaginitis than simple smears and as mere numbers of pus cells alone have some weight in diagnosis this is to be counted as an advantage in addition to showing gonococci in from 20 to 25 per cent. of cases where equally careful examination of simple smears has failed to show this diplococcus.

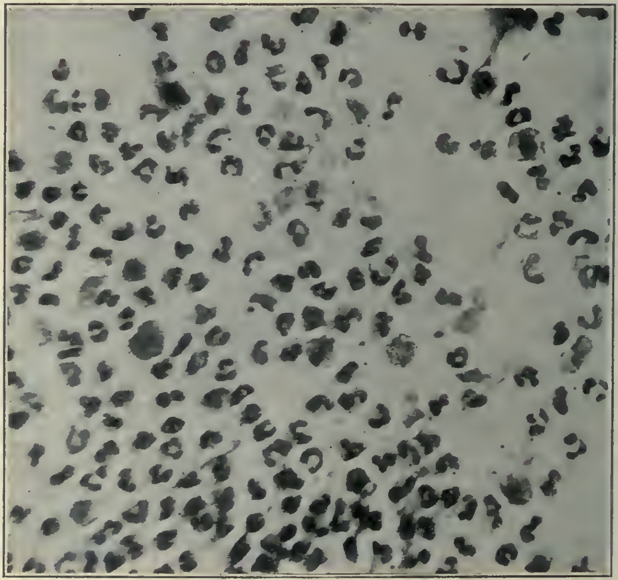

Fig. 2. A direct smear of pus from the neighborhood of the cervix of the same child whose vaginal smear is shown in Fig. 1. Note the large collection of polynuclear pus cells. Gonococci present.

We do not wish, however, to minimize the value of direct smears in diagnosis when these are properly prepared.

Diagnosis by means of vaginal washings is frequently difficult. The cells are likely to bunch in dense masses and the protoplasm about the leukocytes may become shrunken, *i.e.,* the cells are not infrequently pyoknotic so that it is a difficult matter to find intracellular diplococci. In direct smears, however, the pus cells may be fewer but they are easier to examine and yield more definite results.

For this reason we prefer direct smears in all cases where the conditions are such that their examination may reasonably be expected to yield a reliable result.

A good deal depends upon the method of making direct smears. Those prepared of the moisture about the labia and vaginal introitus of chronic cases of vaginitis with scanty discharge by means of cotton swabs are likely to be poor in leukocytes and generally unsatisfactory. (Fig. 1.)

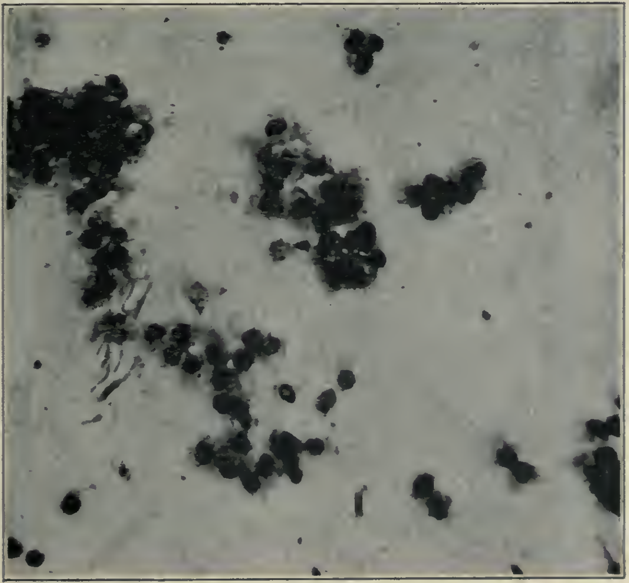

Fig. 3. A smear of the sediment of the vaginal washings of the same child. Note the large numbers of polynuclear pus cells. Gonococci present. The cells are somewhat shrunken, but the smear is a sample of a fairly good preparation.

Smears should not be made with cotton swabs, as the cells tend to adhere to the cotton and there is a tendency for most physicians to rub the swab over a large area of slide with consequent spreading and breaking up of cells instead of rolling the secretion on the slide over a small area (size of a penny).

Smears should be made by means of a loop of stiff platinum wire that may be readily sterilized in the flame of an alcohol lamp. If pus is present about the vaginal introitus smears may be made; otherwise some attempt should be made to secure pus from within the vagina instead of scooping up dirty secretions from the labia.

In addition to securing smears of pus from the vagina an effort should be made, in some cases at least, of securing pus from the neighborhood of the cervix. (Fig. 2.)

For both these purposes the urethroscope may be used, as described by Sinclair, or, as we have found quite serviceable for this purpose, a bivalve ear speculum with long blades. Several of these instruments may be kept on hand; these are quite durable and may be sterilized before and after use. With a child held in the dorsal position the physician may introduce this instrument with practically no pain and obtain smears of pus from the vaginal walls and cervix and be able to inspect the parts with some degree of success. For infants and children under two or three years of age the ordinary tube ear speculum may be used, although with this instrument it is not usually possible to inspect the cervix.

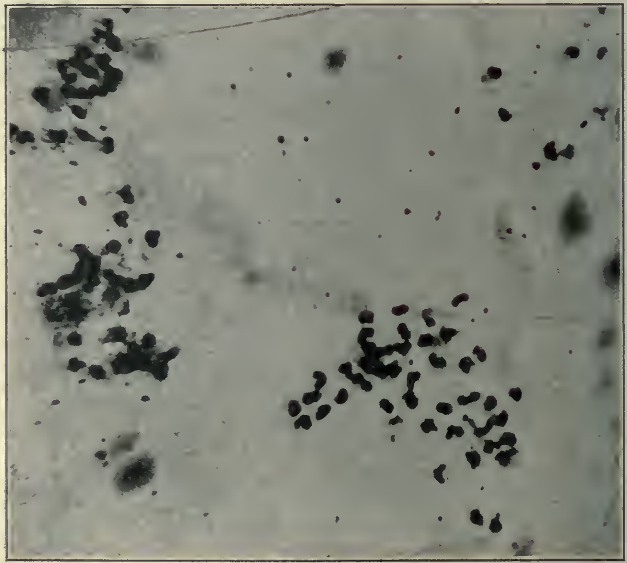

Fig. 4. A smear of the sediment of the same vaginal washings as shown in Fig. 3 after the washings were allowed to stand for twenty-four hours in the laboratory before centrifugalization. Many of the cells show evidences of degeneration and the preparation is unsatisfactory.

By these simple means, however, good smears may be prepared and cultures may be made with least likelihood of contamination. Smears should be evenly spread and it is seldom necessary to make them larger than the area of a penny. Certainly it is poor technic to spread a small amount of material over a large area of slide. Therefore, before a case of gonococcus vaginitis can be regarded as cured or the disease ruled out in a suspect or child seeking admission to a hospital, the physician should bear in mind the tendency of gonococci to lurk in the vaginal mucosa with probably none or but slight external evidences of infection; in these direct smears should be made of the secretions from the vaginal walls and about the cervix, and when these cannot be made under proper conditions, washing the vagina with normal salt solution will remove portions of pus and secretions which may be collected, centrifugalized and the sediment examined by means of stained smears. In this manner the chances of detecting chronic and latent infections and excluding them from the wards of a hospital are greatly increased; negative findings under these conditions give greater assurance of the absence of infec-

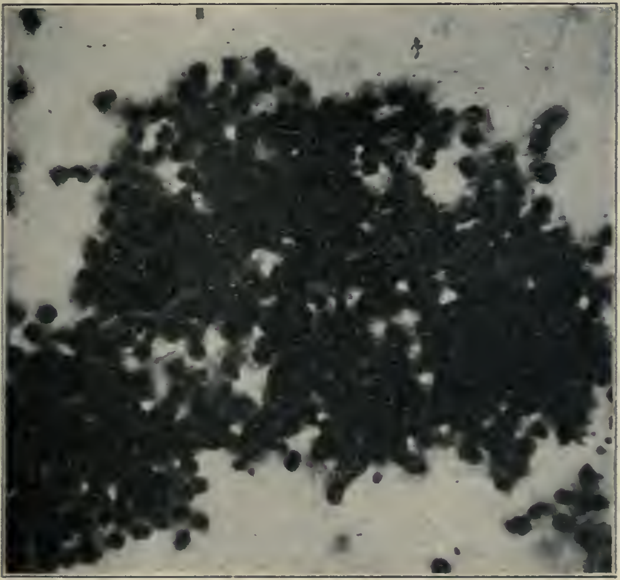

Fig. 5. A smear of the sediment of a vaginal washing; unsatisfactory because the cells are gathered in dense clumps.

tion and treatment guided by these bacteriologic examinations is likely to be more thorough although prolonged.

CONCLUSIONS

(1) The method of vaginal washing in the smear diagnosis of gonococcus vaginitis has its greatest value in the diagnosis of chronic cases and cases under treatment. In these cases the secretions are likely to be scanty, especially about the vulva and vaginal introitus, whereas considerable amounts may be present in the vaginal canal and about the cervix. In vaginal washing these secretions are secured and this explains the success of the method.

(2) Diagnosis by means of vaginal washing is, however, frequently difficult, and in all cases where the discharge is free direct vaginal and cervical smears are to be preferred.

(3) Vaginal washings usually disclose a higher percentage of pus cells in vaginitis than simple smears, and these alone aid greatly in diagnosis.

(4) In subacute and chronic vulvovaginitis with scanty discharge vaginal washings will disclose gonococci in from 20 to 25 per cent. of cases when direct smears are negative; the percentage of positive findings is increased after irritation of the vaginal mucosa with silver nitrate after the method of Norris.

(5) The absence of gonococci in vaginal washings gives greater assurance of the absence of gonococcus infection and treatment guided by these examinations is likely to be more thorough, although greatly prolonged.

We wish to express our thanks for clinical opportunities to Dr. S. MacC. Hamill and his assistant, Dr. Chas. Dorwarth, of the Polyclinic Hospital; also to Dr. Howard C. Carpenter and Dr. Hollopeter, of the Children's Hospital of the Philadelphia General Hospital.

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THE PROPER POSITION OF TONSILLECTOMY IN PEDIATRICS

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Enucleation of the tonsils—or tonsillectomy—on account of the frequency with which it is performed, is at present a subject of great importance to physicians in general and to pediatrists in particular. Sufficient time has elapsed since the performance of this operation became general and a sufficient number of operated cases is available to permit a review of the results of the operation in individual cases and classes of cases.

In this investigation I have made studies of material drawn from several distinct sources. The first of these studies which I here present is based upon the medical histories of one hundred children treated in my private practice.

The 2 cases in this series in which I advised tonsillectomy were:

1. A boy eight years of age who had suffered almost continuously with rhino-pharyngitis and tonsillitis from April, 1909, to October, 1910. In November, 1910, tonsillectomy and adenectomy were performed. The patient has developed normally since that time. There have been less respiratory attacks. There was an attack of diphtheria July, 1912. At the age of twelve, patient weighs eighty-five pounds. Throat is clear.

2. A robust boy twenty-one months old had repeated attacks of rhino-pharyngitis and tonsillitis since one year of age. In December, 1913, when eighteen months old, he had scarlatina complicated by otitis media. He had large pharyngeal adenoids and tonsils which appeared the size of walnuts (but which were really the size of marbles). In April, 1914, tonsillectomy and adenectomy were performed. He has had repeated attacks of rhino-pharyngitis since then. There is a pea-sized mass of lymphoid tissue in the left tonsillar space. The lateral pharyngeal lymphatic columns are hypertrophied and there is a subacute rhino-pharyngitis. Patient has not thrived since operation. Weight, twenty-eight and one-half pounds at three years.

These 2 cases illustrate a point which I have frequently noticed—namely, that enucleation of the tonsils is more beneficial in older children than in infants.

In this compilation I have counted the separate illnesses for which I was consulted as single illnesses irrespective of the number of visits made.

There was one case of bronchial asthma in a two-year old child with a scrofulous diathesis.

There was one mastoid complicating otitis media in a two-year-old girl (1904). Subsequently adenectomy was performed. In 1910, another attack of otitis media with whooping cough. At thirteen years of age the girl is well and strong—tonsils atrophic.

SEPARATE ILLNESSES IN 100 CASES IN PRIVATE PRACTICE DURING

Respiratory	Circulatory	Digestive	Nervous	Urogenital
Upper air passages..72 Rhinopharyngitis. Tonsillitis. Laryngitis. **Ear.** Lungs ....15 Bronchitis. Pneumonia.	Heart .... 4 Blood 13		Chorea, &c.	
Total 87	17	29	3	12

272 illnesses before 8 years. 26 % of cases before 8, upper respiratory.

EIGHT YEARS

Upper air passages...26 Rhinopharyngitis. Tonsillitis. Laryngitis. Ear. Lungs .... 2 Pharyngitis. Bronchitis.				
Total 28	16	5		4

73 illnesses after 8 years. 35 % of cases upper respiratory.

In eight of these cases adenectomy was performed by my advice.

In two of these cases tonsillectomy and adenectomy were performed by my advice.

In two of these cases tonsillectomy had been performed prior to my attendance.

AVERAGE WEIGHT AT AGE OF

1 year..	20 pounds	6 years..	46½ pounds	11 years..	68 pounds
2 " ..	23½ "	7 " ..	50 "	12 " ..	85 "
3 " ..	31 "	8 " ..	56½ "	13 " ..	97½ "
4 " ..	39 "	9 " ..	60½ "	14 " ..	106 "
5 " ..	44 "	10 " ..	63 "		

GENERAL SIZE OF TONSILS IN THESE CASES AT AGE OF

0—1 year	....size of pea..	36 cases
1—6 "	....size of pea to hazel nut........................	39 "
6—10 "	....size of almond kernel to marble.............	13 "
10—14 "	....size of hazel nut to bean (atrophying).............	12 "

It will be noticed that the weights for the first three years are below the ordinary averages. This is due to the fact that a number of the cases in their infancy were difficult feeding and malnutrition cases. In later childhood the weights are somewhat above the average for their ages.

There were 5 cases of arthritis, including cases classed as "rheumatism." Finally, in two patients in a total of ninety-eight having tonsils I have recommended tonsillectomy—that is in about two per cent. Nevertheless the unoperated patients also recovered from their illness and are well and healthy.

NINE-YEAR OBSERVATION PERIOD FROM APRIL 18, 1906, TO APRIL 18, 1915

Developmental. and Dyscrasias.	Skin	Exanthemata	Infections	Arthritis	Unclassified
Malnutrition. Hemophilia. Feeding. Hernia. Adenoids. Cervical adenitis, Etc.		Pertussis Parotitis.			
46	26	34	6	5	7

Adenoids. Goitre. Cervical adenitis.					
4	6	6	2		2

Tonsils up to size of marbles may be regarded as physiologically hypertrophied.

As a rule the tonsils are smaller after 10 years of age than at 8 or 9 years, and atrophy is well advanced by 14 years of age.

Atrophy begins at upper part of tonsil and progresses downward, often with the result that the tonsil appears to be divided by a transverse sulcus which may be mistaken for a patulous crypt.

The average size of the tonsils at the given ages is here stated because such information, if it exists in medical literature, is not generally known and in the full knowledge that the size is inconstant. The most definite statement I have been able to find is that of Jonathan Wright, "If its normal state is one of comparatively little obstruction to the passage of food and air, such a condition varies between wide limits."—*N. Y. Medical Journal* (August 8, 1908).

This series of 100 cases represents the average run of cases which come into my practice. There was no selection of cases. They were taken alphabetically, rejecting only cases which remained under my care for less than one year (in the belief that I could not obtain information of value from such cases). A number of these patients came into my treatment when less than a day old and I have had some of them under observation continuously for fifteen years.

Such being the case, I have been able to direct their entire medical life during that time. This accounts for the small number of tonsillectomies performed on them. For in a number of these cases which I have referred to throat specialists, for adenectomy only, the various throat specialists have in practically every such case, irrespective of the reason for which adenectomy was advised, sought me out either by telephone or personally or through the parents of the child in the effort to convince me that in that particular patient tonsillectomy also should be performed. They have uniformly failed to convince me, and the record above seems to justify my decision.

In my clinic at the San Francisco Polyclinic conditions are materially different. Patients usually come into my care after having had other medical attendants, so that I am not in a position to guide their medical destinies.

For purposes of comparison I present the record of 100 cases compiled from histories in the Pediatric Clinic of the San Fran-

SEPARATE ILLNESSES IN 100 CASES IN THE PEDIATRIC

Respiratory	Circulatory	Digestive	Nervous	Urogenital
Total 43	15	5	7	4

129 illnesses before 8 years. 33 1-3 % before 8 upper respiratory.

EIGHT YEARS.

Total 9	5	1	1	3

24 illnesses after 8 years. 37½ % of cases upper respiratory.

In two of these cases tonsillectomy was performed by my advice.

In two of these cases tonsillectomy was performed against my advice.

In eighteen of these cases tonsillectomy was performed prior to my attendance.

These operations were performed by various laryngologists of cities throughout the United States. Subsequently they visited the San Francisco Polyclinic for treatment.

cisco Polyclinic. Here also there was no selection of cases. Forty of the histories are those of all the cases which I treated in the clinic while compiling these records. Sixty were brought to me by the clerk of the Polyclinic at my request to bring me that number of histories of cases treated in my clinic. These 100 cases present a fair average of the general run of cases in the clinic.

To compare this series of 100 cases with the 100 previously cited:—

There were more than five times as many tonsillectomies as I had advised in my cases. In this series I advised two tonsillectomies in 80 patients having tonsils that had not yet been operated upon. In 1 case in which I referred the patient to a throat specialist to be operated for adhesio linguæ, and in one where I referred the patient to be operated for adenoids, the throat specialist removed the tonsils also.

There was 1 case of cardiac asthma and 2 of bronchial asthma, all occurring in patients upon whom tonsillectomy was performed and all beginning subsequent to date of operation.

There were 3 mastoids—1 in a six-months-old child, 1 (Case 4) in a seven-year-old child, on whom tonsillectomy had been performed at five years of age, and 1 case (Case 21) in a fifteen-year-old patient, whose tonsils had been enucleated the previous year.

CLINIC OF THE SAN FRANCISCO POLYCLINIC FROM 1913 TO 1915

Developmental	Skin	Exanthemata	Infections	Arthritis	Unclassified
32	11	3	4		5
4					1

Here I append a synopsis of the history of each of these cases of tonsillectomy so far as available.

Twenty-two case histories of tonsillectomy performed upon patients examined by me from 1913 to 1915 in the Pediatric clinic of the San Francisco Polyclinic.

Case	Tonsillectomy and Adenectomy	Age	Why operated	Date Visited Clinic	Age
No. 1	1905 (in New York)	2		Sept., 1914	11
No. 2	Dec., 1912.	3½	Mouth breather.	May, 1914	5
No. 3	1912.	4		May, 1914	6
No. 4	1908.	5		Nov., 1913	10
No. 5	March, 1913.	3	Frequent colds. Hypertrophied tonsils. Adenoids	Mar. 27, 1914	5
				Oct., 1914	....
No. 6	Feb. 2, 1914.	5	Operated by my advice. Diseased tonsils.	Jan., 1914	5
				Feb. 17, 1914	....
No. 7	April, 1913.	5		Aug., 1914	6½
No. 8	March 13, 1914.	5		May, 1914	5
				June 16, 1915	....
No. 9				Mar., 1913	6
				Feb., 1914	....
				Dec., 1914	....
No. 10	March 24, 1914.	5½	Mouth breather. Enuresis.	Mar. 31, 1914	5½
No. 11	Nov., 1913.		Repeated attacks of epistaxis. In this case I advised adenectomy.	Oct. 27, 1913	2½
No. 12	July, 1913.	6½	Swelling left side of neck.	Feb., 1914	7
No. 13	1911 (Ton. & Aden) 1912 (Adenec).	6 7		June, 1914	9
No. 14	1912.	7	To cure husky voice. Mother reports tonsils were enucleated (as were also many others in child's class, because the *school nurse ordered them out*).	Nov., 1915	10
No. 15	Oct., 1915.	7	In this case I advised adenectomy.	Sept., 1914	7
No. 16	1912.	7½		Feb., 1914	9½
No. 17	1912.	7½	To reduce cervical glands.	Mar., 1915	10

Major Complaint	Status	Remarks
Cardiac asthma.	Valvular heart disease. Tonsils present, size of beans.	
Asthma.	Weight 40 pounds. Hypertrophied thymus Throat clear. Right cervical glands size of peas.	Asthmatic attacks began one year after operation and still continue.
Tonsillitis.	Tonsillar tissue present. Left tonsil inflamed.	
Chorea. Anemia.		Three years ago right mastoid (in 1912).
Earache. Eczema external auditory meatus. Constant colds.	Pharyngitis.	Had to stop operation after one tonsil removed on account of bleeding. One week later completed.
Rhinopharyngitis. Pharyngitis.	Buried, diseased tonsils.	
Persistent pharyngitis.	Throat specialist reports "adhesions between anterior and posterior faucial pillars." Post naso-pharyngitis.	
Chorea.	Stump of left tonsil is ulcerated. Pillars of tonsils grown together.	Cervical adenitis.
....	Right tonsillar gland size of marble.	
Scrofula. Referred to my clinic for building up. Ears discharging. Rhinopharyngitis. Earache.	44 pounds.	
Coli-cystitis.	April 14, 1914. Right tonsil removed. Left tonsil partly removed, upper part left.	Has wet bed nightly since infancy. May 15, 1915, operator reported "small tab left in left fossa."
Repeated nosebleeds. Nervous.	Rhinopharyngitis. Adenoids (before operation). Nov. 5, 1913, report of throat clinic "enlarged cervical glands, diseased tonsils, adenoids."	Feb. 26, 1914, tonsillectomy 4 months ago. Very nervous since. Insomnia. Anemia.
Swelling left side of neck.	Cervical adenitis.	
Mouth breather.		
Earache. Eustachian catarrh. Chronic pharyngeal catarrh.	Cervical glands size of buckshot. Tonsils size of almonds. Lateral pharyngeal columns hypertrophied.	Child's voice is husky.
Pertussis. Carious teeth. Adenoids.	Tonsils size of hazel nuts before operation.	Recommended adenectomy only. Throat doctor removed tonsils also.
Tonsillitis. Large tonsillar glands. Gastritis.	Has large inflamed tonsils. Rhinopharyngitis. 48 pounds.	Mother states tonsils removed two years ago. "Has not been well since."
Earache.	Bilateral cervical adenitis.	

Case	Tonsillectomy and Adenectomy.	Age	Why operated	Date Visited Clinic	Age
No. 18	Oct., 1912.	8		Feb., 1914	10
No. 19	May, 1914.	9	Advised by public school inspector.	July, 1914	9
No. 20	Feb. 14, 1914.	9	Earache. Adenitis. Operated by my advice.	Dec., 1913 July, 1914	9 ....
No. 21	Jan., 1914.	10		Jan. 7, 1914	10
No. 22	1908.	14		1915	

In 7 of the 22 cases on whom tonsillectomy was performed, part of the tonsil was left or had regrown, while in several others there was redundant post-pharyngeal lymphoid growth.

In the cases where tonsillectomy was performed on account of large cervical glands the large cervical glands persisted. This observation coincides with my observation of patients in private practice. In 2 cases (not included in the 100 reported) in my private practice where tonsillectomy was performed on account of cervical adenitis, ultimately the cervical glands had to be extirpated.

Tonsillectomy had been performed in this series of cases more frequently to relieve conditions associated with the upper respiratory tract than for any other purpose. Still a larger percentage of affections of the upper respiratory tract occurred in this series of cases in which two tonsillectomies had been performed than in the previous series in which only five had been performed, the increase in percentage being especially marked before the eighth year division. Fifteen of the 22 tonsillectomized cases presented as their major complaint in the two-year observation period pathologic conditions associated with the respiratory system, which number might be increased by addition of 4 cases of adenitis.

Major Complaint	Status	Remarks
Asthmatic attacks.	Throat clear.	Asthmatic attacks of recent inception.
"Lump under left side of jaw."	Adenitis. At angle of left inferior maxilla is marble size, tender, resilient gland, adherent to bone.	4 weeks ago tonsillectomy. Swelling appeared one week later. Some teeth were removed before operating. Large diseased left molar appears to be cause of adenitis.
Earache. Mass in right side of neck.	Anemia. Cervical adenitis.	
Patient very nervous. Adenoids. Adhesio linguae. Mitral insufficiency.	Tongue tie. Adenoids. Pharyngitis. Atrophic tonsils.	Referred to throat specialist for tongue tie. Specialist also performed tonsillectomy.
Swollen cervical glands. Rhinopharyngitis.	Tonsillar tissue present. Gaping crypts. Cervical glands enlarged past three weeks.	A year after tonsillectomy had mastoid. Tuberculosis of bone as infant.

Two cases of chorea developed—Case 4, in a ten-year-old patient, whose tonsils had been enucleated at the age of five years; Case 8, in a five-year-old patient, whose tonsils were enucleated two months previously.

Without comment I shall pass over the cases operated because the school inspector so directed and the case of enuresis due to cystitis.

In my private practice 5 cases of arthritis occurred, and in the 100 clinic patients no case of arthritis was treated. I call attention to this paucity of arthritis cases because arthritis is one of the chief causes cited for inducing tonsillectomy.

This leads to a consideration of the third line of investigation I have undertaken. It may be alleged that the number of patients reviewed in the preceding two series is too small and that the number of operated cases cited is inadequate for the drawing of conclusions.

A few systematically observed authentic cases furnish more reliable information than great numbers of unsystematized observations and unproved theories.

Early in the current year I sent to specialists for the throat the following set of questions, requesting accurate or approximate answers and stating that the data so secured was to be used by me in the preparation of a paper on tonsillectomy:—

(1) When did you commence performing the operation of tonsillectomy?

(2) Has tonsillectomy entirely replaced tonsillotomy in your practice?

(3) On how many individuals have you performed this operation? (*a*) Under fourteen years of age? (*b*) Over fourteen years of age?

(4) What do you consider indications for this operation?

(5) Have results been satisfactory? How do you estimate results?

(6) What morbid conditions do you attribute to diseased tonsils? (*a*) Local: (*b*) General:

(7) Have any accidents occurred in your series of operations? Fatalities: Number: (*a*) From hemorrhage: (*b*) From anesthetic: Not fatal: (*a*) Hemorrhage: (*b*) Any other kind:

(8) What do you consider contraindications to the operation?

(9) When you perform tonsillectomy do you remove pharyngeal adenoids also?

(10) What unfavorable sequelæ to tonsillectomy have you observed? (*a*) Local: (*b*) General:

Amended forms of this leaflet were sent to general surgeons, physicians, pediatrists and hospitals.

Here I present a synopsized review of the forty-five responses received:—

(1) A few specialists began enucleating tonsils in 1905; the others at later dates.

(2) Tonsillectomy has practically eliminated tonsillotomy in the pratice of the men reporting.

(3) Sixteen throat specialists estimate their combined tonsil enucleations at 10,014. Of these they place 7.486 before fourteen years, 2,528 after fourteen years.

(4) Indications for operation arranged in groups determined by the order of frequency enumerated by specialists were: (*a*) Recurrent tonsillitis, rheumatism, mouth-breathing, enlarged cervical glands, obstruction to respiration. (*b*) Hypertrophied tonsils, adherent and diseased tonsils, repeated colds. (*c*) Arthri-

tis, malnutrition, systemic poisoning, earache, rhinitis, sore throat. (*d*) Obstructed and diseased follicles, inflamed tonsils, presence of degenerated material in tonsillar crypts, diseased condition of tonsillar tissue, chronic hyperemia of fauces, buried tonsils, deafness, catarrh of Eustachian tubes, pressure on Eustachian tubes, acute and chronic otitis, endocarditis, myocarditis, nutritive disturbance, obscure stomach trouble, retarded development, anemia, asthma, focus of infection, foul breath, anorexia, restless nights, so-called bilious attacks.

(5) Twenty-one find results satisfactory. They estimate results by "improvement in general health and mental features, less ear trouble, improved breathing, amelioration of symptoms, by reports from parents as to cure or relief of the conditions caused by diseased tonsils, by condition of patient two or three months after operation, gain in weight, fewer colds, blood index, removal of local inflammation and of recurrent attacks of tonsil infection, improvement in strength and resistance to colds and ordinary infections."

One specialist thinks the operation of wonderful value where it is indicated, but he objects to the promiscuity with which it is done.

(6) (*a*) Local morbid conditions attributed to diseased tonsils are: frequent sore throat and recurrent tonsillitis, peritonsillar abscess, cervical adenitis, otitis media, deafness, rhinitis, chronic catarrhal conditions, respiratory obstruction, lack of development of skull. (*b*) Systemic conditions grouped in order of frequency stated are: (1) Rheumatism (in a class by itself); (2) heart disease, anemia, nephritis, tuberculosis, arthritis, chorea, autointoxication; (3) retarded development, gastric disturbance, diseases of metabolism, general debility, asthma, aggravating factor in individuals predisposed to hyperthyroidism.

(7) (*a*) Three fatalities were reported. (*b*) Twenty-six hemorrhages were reported. Several throat specialists also reported hemorrhages without spescifying the number. One case of acidosis was reported.

(8) Contraindications mentioned are: "General condition of patient, hemophilia, inability to take anesthetic, fever, proximity of inflammation to tonsils, constitutional heart and lung contraindications, acute swelling of cervical glands, presence of cold or bronchitis."

(9) It is the general custom of those reporting to remove adenoids also.

(10) Unfavorable sequelæ noted were:—

Locally, injury to uvula and soft palate, dryness of throat, impairment of speech, cicatricial bands causing temporary discomfort, acute otitis media, contraction of pillars irregularly, tendency to become over-fat and to develop some signs of hyperthyroidism, recurrence of adenopathy, exacerbation and nephritis.

General, "Prolonged depression in adults, increased colds, epileptiform convulsions, failure of relief of secondary infection."

Physicians other than throat specialists report tonsillectomies performed by themselves.

Hospitals report 3,418 tonsillectomies with 9 hemorrhages and 1 death (not included above) from edema glottidis. As a rule, patients remained in hospital twenty-four to forty-eight hours.

Prominent features of this report are:—

(1) The enormous number of tonsil enucleations.

(2) The large proportion of tonsil enucleations in children; three-fourths of all cases reported were under fourteen years of age.

(3) The multiplicity of indications for operation, so great as to furnish a reason for enucleating practically every existing tonsil and only equalled by the number and variety of morbid conditions attributed to diseased tonsils.

(4) The universal satisfaction of throat specialists with the results of the operation and the comparatively insignificant unfavorable sequelæ noted.

(5) The custom of performing adenectomy whenever tonsillectomy is performed.

(6) The element of danger attached to the operation.

Tonsillectomy has become more than a therapeutic procedure: it has become a menace. It is performed not only where definite indications are present, but also for the most trifling reasons (witness reports of reputable physicians that they consider anorexia, faucial hyperemia, restless nights, indications for tonsillectomy), and sometimes for no reason, as in the instance I here cite.

In January of this year, while in a public hospital, I was shown by an operator adenoids and tonsils he had removed from a twenty-months'-old baby. The tonsils were the size of a pea and appeared normal. To my question why he had removed them, the doctor answered that they were perfectly healthy, but he had removed them because he had the child anesthetized for adenectomy, and he thought he might as well removed the tonsils also and avoid future trouble. This is not an isolated case. I know of other similar cases.

A highly esteemed throat specialist, whose cases are not included in the above tabulation, assured me that in the period 1906 to 1914 he had done 8,000 tonsil enucleations, equivalent to nearly three operations every day in one man's practice.

The justification for this large number of tonsillectomies is found in the numerous morbid conditions attributed to the tonsils as entrance ports, and to the general endorsement by the medical profession of this procedure. Without attempting to discuss all of the morbid conditions attributed to unhealthy tonsils I shall consider a few of the most important ones.

Rheumatism was named by more physicians in their lists of morbid conditions emanating from the tonsils than any single other condition. That they did not intend the term to denote arthritis in general is evident from the fact that many of them named both rheumatism and arthritis. But we do not know what rheumatism is. Leaving the chemical theory of the etiology of rheumatism, medicine has accepted the bacteriologic theory. In 1893 Sahli stated that he "regarded acute articular rheumatism as an infectious disease due to the action of pyogenic cocci." It was his original view that rheumatism is not due to a single strain, but to a variety of attenuated cocci and is therefore to be regarded as a clinical group of diseases rather than as a single disease. Since Sahli various investigators have in turn discovered various microörganisms to be the cause of rheumatism. But their theories have not stood the test of time. At present, Poynton and Paine regard the micrococcus (diplococcus) which they have obtained in cases of the rheumatic cycle as a specific organism or a specific strain in the etiology of rheumatism.

Rosenheim (Johns Hopkins Hospital Bulletin, No. 212, November, 1908, p. 339, *et seq.*) reports 5 cases, diagnosed as acute articular rheumatism, in all of which the streptococcus alone, or associated with staphylococci, were found in the tonsils, and he states (p. 343): "The organisms found in the tonsils in the cases reported are probably the causal agents of the attacks of acute articular rheumatism." Indeed, we do not know what rheumatism is; we do not know if it is a single disease or a group of diseases (I incline to the latter view); we do not know what causes it. It seems to me unscientific and unjustifiable under these circumstances to remove essential organs for the sake of a theory.

These observations of Rosenheim have been widely published (Johns Hopkins Bulletin, 1908, and Maryland Medical Journal, February, 1911), and are much quoted in support of tonsillectomy for the cure of rheumatism. But if one reads the article at first hand he finds it by no means convincing. In all 5 cases the tonsils were removed. But in only 2 of the cases Rosenheim reports the patient well subsequently; in the other 3 he reports only improvement.

Endocarditis—Heart disease comes next in the estimation of physicians as a morbid condition adducible to diseased tonsils. At least three-fourths of all tonsillectomies are performed on children. But endocarditis, while it does occur, is a very rare condition in childhood. In his book, "Infancy and Childhood," 1897, p. 574, Holt says that in reports of autopsies of over 1,000 children less than three years of age not a single case is to be found.

Rokitansky (Lehrbuch der Pathol. Anat., third edition, Vol. I., p. 387, 1844) first described fine granular masses in endocarditic deposits. Winge (Constatt's Jahresbericht, 1870, Vol. II., p. 95) described streptococci in the heart of a man who died of septicemia caused by an abscess of the foot. Heiberg found similar organism in the ulcerated heart valves of a woman dying of puerperal septicemia. Eberth (1873) described 2 cases of diphtheritic endocarditis. Netter (1886) and Weichselbaum identified the pneumococcus and colon bacillus. Heller discovered the tubercle bacillus in 5 cases of endocarditis. Various other bacteria have been found in endocarditic lesions. In 1898 I found pyocyaneus bacilli in the endocardial lesions of a two and one-half year infant. ("Pyocyaneus-Endocarditis im Kindesalter," Centralb. für Bakteriol., Parasitenk. und Infectionskrankh., 1898, No. 25.) The pyocyaneus bacilli had reached the circulation from the intestine. In my Master's Thesis (May, 1902, University of California), "The Etiology of Endocarditis, with Especial Reference to Bacterial Agencies," I stated that in general all bacteria pathogenic for the individual may cause endocarditis under proper conditions. There must be a *locus minoris resistentiæ* and the bacteria must be in the blood. They may enter the circulation from various sources—from an abscess of the foot (Winge's case), from the septic womb, from the intestine, from the tonsil. But no single case of endocarditis has, so far as I am aware, been positively proved as emanating from the tonsil.

Koplik (American Journal of Medical Sciences, July, 1912) has published reports of cases of heart disease following tonsil operations.

Chorea, like rheumatism, is of unknown etiology. Enucleation of tonsils is employed as a curative method in chorea. But in 2 of the 22 cases of tonsillectomy reported above from the San Francisco Polyclinic chorea developed subsequently to tonsillectomy. While directing the pediatric clinic of the University of California I saw a case of chorea develop in a hitherto healthy child one week after tonsillectomy.

Enlarged cervical glands are a favorite reason for removing tonsils. As stated above, in the cases in the Polyclinic and in my private practice, in cases which tonsillectomy was performed on account of enlarged cervical glands, the glands remained enlarged. While there may be exceptions to this rule, this has been my observation in general in cases of chronic glandular enlargement.

The assumption that the tonsils are the focus of tuberculous infection seems to be unjustified. The simple fact that over 90 per cent. of chronic cervical adenitides are tuberculous (Von Bergmann and Bruns, "Chirurgie des Halses, der Brust and der Wirbelsäule," third edition, Vol. II., p. 86), while only 4 per cent. to 6 per cent. (Seawell, Journal of American Medical Association, September 9, 1911, p. 868) of tonsils are tuberculous would seem to controvert this theory. The view which I expressed in my prefatory announcement, that the "tonsils are excretory organs for the cervical glands," explains this hitherto inexplicable condition. It leaves intact the theory that bacteria may pass through the tonsil without affecting it, but it changes the view of the direction in which they are to be regarded as travelling. Instead of passing through the tonsil to the gland they pass from the gland through the tonsil. When it is recalled that Naegeli found tuberculosis in 97 per cent. of all adult bodies it is plain that there are sufficient avenues by which tubercle bacilli may reach the cervical glands without seeking the 4 per cent. tonsil foci. Ingalls (Journal of American Medical Association, July 12, 1913, p. 116) found cervical adenitis in only 4 per cent. of 100 tuberculous cases, and in only 1 case of cervival adenitis the slightest evidence of disease of the tonsil.

Respiratory Affections furnish the bulk of the cases for which tonsillectomy is performed. The tables which I have presented above indicate that instead of preventing respiratory affections tonsillectomy increased them. Particularly severe conditions have supervened in the cases cited—as mastoids, ear trouble, asthma. Still, some of the most brilliant results of tonsillectomy which I have seen occurred in cases of chronic ear trouble.

Removal of tonsils for simple *hypertrophy* of ordinary degree is a purely empiric procedure. It is done most frequently before the ninth year, since the tonsil attains its greatest dimensions about the sixth to eighth year, and if tonsillectomy is not performed prior to the ninth year this apparent reason for operating usually disappears spontaneously as the tonsils atrophy. Perhaps this has a bearing on the fact that in the series of Polyclinic cases, 18 out of a total of 22 tonsillectomies were performed before the ninth year. In private and clinical experience in general, as well as in the cases tabulated above, I have found that babies furnish the great bulk of patients operated for tonsillar atrophy.

In this connection, M. Neustadter ("Contribution to the Etiology of Poliomyelitis," Journal of American Medical Association, September 7, 1912, p. 785) makes the following instructive statement. "For a period of eleven years I have had the opportunity to examine school children of ages from six to fourteen years. I have noticed that between the ages of five and eight years there are present hypertrophied tonsils in 85 per cent. of the children examined, but as we go up in the age scale—say at fourteen—we find only about 15 per cent. of the children with hypertrophied tonsils."

Swain (Annals of Otology, Rhinology and Laryngology, September, 1911, p. 552) says: "For years it has been impressed upon me that if I could get children past the sixth or seventh year without doing the then universal clipping tonsillotomy, the child would seem to grow out of the necessity for these operations and would go on to the development of a perfectly healthy, normal individual. Sometimes the indications seemed to be absolutely certain and conclusive that operation was necessary and for some reason or other it was deferred—the necessity passed by, the tonsils shrunk, and the patient grew and waxed strong."

Will it not prove to be a fact that hypertrophy, far from being a morbid condition, is a physiologic process called into being by necessity of increased work in repelling infections from without and in eliminating deleterious matter from within the body? Such seems to be the opinions expressed by Neustadter, Swain, Wright (Boston Medical and Surgical Journal, May 20, 1909), Ashurst and others. Mackenzie (Annals of Otology, Rhinology and Laryngology, June, 1912, p. 416) believes that "The rôle of the tonsils as portals of infection has been exaggerated." I believe that simple hypertrophy of the tonsils is not the cause of disease, but a result of increased functional activity.

Concerning the value to be attached to general endorsement by the medical profession little needs to be said. It is a well-known fact that the medical profession is prone to stray from the true path. Mature observation and critical investigation ultimately recall her, but the history of medicine is largely a history of learning by mistakes. I need only to name the King's Evil, the Weapon Ointment, Perkin's Metallic Tractors, Starvation in Typhoid Fever, Sulphuretted Hydrogen by Rectum for the cure of tuberculosis as late as 1886, to indicate that the medical profession at times quite blindly follows a leader.

Sometimes investigators are followed or quoted without accurate knowledge of their work. Sometimes the work is convincing, but their deductions are fallacious. George Bacon Wood's articles on the "Drainage of the Faucial and Pharyngeal Tonsils" (American Journal of Medical Sciences, August, 1910, and April, 1906) are widely referred to in support of tonsillectomy. Wood's experiments show that the tonsils have lymphatic connection with the deep cervical glands and that other structures, notably the gums and pharyngeal tonsil, also communicate with them. In these papers he does not even discuss tonsillectomy.

Seawell's "Histological Examination of the Faucial Tonsils with Reference to Tuberculosis" (Journal of American Medical Association, September 9, 1911), embracing reports of painstaking examination of 772 pairs of tonsils, with discovery of tuberculosis in only 4 per cent. to 6 per cent., does not seem to be to justify the conclusion that the tonsils are important portals for tuberculosis of the cervical glands. Especially does this conclusion seem unjustified when taken in connection with his statement that "tuberculosis of the tonsil is, as a rule, secondary to tuberculosis of the lungs and primary infection is comparatively rare." On the contrary, this report seems to me to show the insignificance of the tonsil as a focus of tuberculous infection.

The variance of the reports of throat specialists as to the results of tonsillectomy as compared with my own observations raises questions of considerable interest. Is the throat specialist in a position to judge the results of these operations? I think he is not, as he does not have the opportunity to follow his cases. He sees the patient a few days or a few weeks, the wound heals, the patient recovers and the throat specialist deduces that the result is satisfactory. But if in the course of time—months, or even years—ill effects result from the absence of tonsils, the throat specialist has lost sight of the patient and he has not even the knowledge of these events. The family physician, or especially the pediatrist, has this opportunity and can far better judge the results.

Again, certain favorable developments subsequent to the operation are attributed to the operation because they come after the operation. I refer especially to the rapid development of the child, gain in weight, broadening of the jaw and fauces, improved respiratory conditions. But it is to be recalled that this operation is most frequently performed before the seventh or eighth year and just at this time all normal children experience marked changes. With a second dentition the jaw broadens, the respiratory passages become larger, the individual, in fact, passes from babyhood to childhood. My records show that as a class untonsillectomized children over eight years of age are heavier than those whose tonsils have been removed.

But just at this juncture it may be instructive to note that adenectomy also is practically always performed in children when their tonsils are removed. Under these circumstances it cannot be estimated how much improvement is due to tonsillectomy and how much to adenectomy. For my own part I have seen very satisfactory results from adenectomy both before and since tonsillectomy was practiced. To clear up this question I have repeatedly suggested to throat specialists that in a series of cases they should remove the tonsils only and leave the adenoids.

This would clear up the situation decidedly. But none has consented to do this. Why not? Often we have adenoids removed and leave tonsils. In fact, this is still my practice, and the results are satisfactory.

Concerning the dangers of the operation, I shall make no comment beyond the statement that four deaths and enough hemorrhages to emphasize the fact that the operation is not devoid of danger were reported.

All that has preceded this point is based upon veritable observation of cases. From this material I believe that the present indiscriminate practice of tonsillectomy is unjustified because it is empiric; it is done at times without cause; many of the alleged morbid symptoms attributed to diseased tonsils have not been proved to be caused by them; its results in my observation have been unsatisfactory in many cases; it is dangerous.

Now there are reasons which may be advanced why the tonsils, as a rule, should be conserved.

(1) It is improbable that they would occur in the human body if they were superfluous.

(2) As modified lymph glands they may combat infections. This view is supported by Brieger's and Goerke's and Stöhr's observations of the emigration of lymphocytes from the center to the periphery of the tonsil.

(3) It has been suggested that they furnish an internal secretion of value.

(4) The tonsils may be eliminative organs for the waste products of dentition. (Wright.)

(5) They may be eliminative organs for systemic diseases, including diphtheria and scarlatina. (Ashurst.)

Swain believes, as I do, that tubercle bacilli in the tonsil may be there on the way out.

(6) They play a rôle in the modulation of the voice.

(7) They moisten the food and perhaps throw out a digestive ferment.

(8) There is an intermediate course to be considered, namely, tonsillotomy.

Göppert states that tonsillectomy is only permissible where tonsillotomy has failed to quiet a tendency to recurrent peritonsillar abscess or where articular rheumatism and hemorrhagic nephritis already complicate cryptogenetic sepsis and discernibly chronically injure the child's health. (F. Göppert, "Die Nasen-Rachen und Ohrenerkrankungen des Kindes in der Täglichen Praxis.)

(9) They take up foreign matter from the nasal mucous membrane. (Lenart.)

(10) Lastly, as stated in my prefatory remarks, I have proved by animal experiments that the tonsils are excretory organs for the cervical glands.

Tonsillectomy is contraindicated in hemophilia, status lymphaticus, diabetes, during epidemics of diphtheria and scarlet fever, during acute tonsillitis, during active cervical adenitis, at time of adjacent local inflammatory affection.

IN CONCLUSION

Tonsillectomy is an excellent surgical procedure in certain cases.

It should be the operation of choice in malignant disease of the tonsils.

It may be indicated in recurrent peritonsillar abscess.

It should not be performed in infants.

It should only in exceptional cases be performed before the eighth year. Between the eighth and fourteenth years if positive evidence of serious local or systemic injury emanating from diseased tonsils can be adduced, and if the tonsillar affection does not yield to conservative treatment enucleation is indicated.

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THE PARATHYROIDS AND TETANY—E. L. Hanes (New York Medical Journal, June 26, 1915), summing up an analysis of the literature on the parathyroids and tetany, states that the relationship between the two is most intimate; and that in large numbers of instances the tetanies of childhood and of the puerperium, those of certain nutritional diseases, and those following operative removal of the parathyroid glands are due to the loss of or interference with the functions of these organs. It is not yet clear in what manner the parathyroids are implicated in the so-called epidemic and endemic tetanies of Frankl-Hochwart, or why certain occupations predispose to this reaction in contrast to other allied forms of labor.—*Medical Record.*

TONSILS EXCRETORY ORGANS FOR CERVICAL GLANDS. PRELIMINARY REPORT

BY SANFORD BLUM, A.B., M.S., M.D.

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In a series of experiments on guinea pigs I have demonstrated that the tonsils are excretory organs for the cervical glands. Chemical substances which I have injected into the cervical glands of guinea pigs I have subsequently found in the tonsils of these animals. Such chemicals as I have employed do not occur normally in the tonsils of the animals experimented upon.

Furthermore I have subsequently found the chemical injected into the glands of these animals in their oral cavities. I have also recovered from their oral secretions and have seen in their tonsils bacteria previously injected into the cervical glands of the animals.

At this time I wish to make a preliminary report to the effect that the tonsils are excretory organs for the cervical glands.

I am at present engaged in further researches in this subject and shall announce the results more fully in a separate paper as soon as I shall have completed my investigations.

FEVER FROM NASOPHARYNGITIS IN INFANTS — Marinho (Brazil-Medico, Rio de Janeiro, March 1, 1915, Vol. XXIX., No. 9, pp. 65-72) bases the diagnosis mainly on exclusion of other causes for long drawn out fever in an infant and the discovery of enlarged glands in the neck. The fever may drag along for weeks and the glands may keep swollen and painful long after the nose and throat have returned to apparently normal conditions. The glands never show any disposition to suppurate, even although they may be tender and painful. An incision never brings pus and the fever still keeps up. The type of fever is irregular, and afebrile days may intervene. A discharge from the ear is at times the only other sign of anything wrong. Most clinicians ascribe the fever to the ear trouble, but Marinho insists that an otitis does not send up the temperature unless there are complications. He has encountered cases of protracted fever through months for which the chronically enlarged glands were apparently the only explanation.—*Journal of American Medical Association.*

SIX CASES OF HEMORRHAGE IN NEWLY-BORN BABIES

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It is not the purpose here to describe this condition or review the literature since numerous articles have appeared for some time on this subject. In each physician's practice, however, the number of cases of this condition must of necessity be comparatively small, and it is only in a study of the published cases that the true value of the blood serum therapy can be learned. All of these cases were seen in consultation in the practices of my colleagues of this city. In each instance the hemorrhage was spontaneous with the exception of Case 2, in which the trauma of circumcision was the exciting cause. There was, however, absolutely no history of hemophilia in this family.

CASE 1. Baby Helen* was born April 14, 1912, at 1 P.M., the first baby of healthy parents. The mother's urine for some weeks before birth had contained a small amount of albumen. The labor was a low forceps, in which ether, not chloroform, was used. The cord was tied, baby was washed, weighed (6 pounds), put to bed. On the evening of the first day a large movement of meconium occurred; on the afternoon of the second day another large meconium movement. During the evening of the second day baby vomited a trace of blood. On the morning of the third day a large meconium movement was passed with considerable blood of a bright-red color on the napkin: 8 c.c. of antistreptococcic serum was given. On the fourth day three movements containing large amounts of blood were passed; ten c.c. more of antistreptococcic serum was given.

It was at this point, 10 P.M. on the fourth day, that I first saw the baby, in consultation. The physical examination was negative except for the profound pallor and prostration. The father readily consented to act as donor of the blood for his baby. A vein was aspirated and 6 to 8 ounces of blood withdrawn. After separation of the serum, about 1 A.M. on the morning of the fifth day, 15 c.c. were given, followed by 10 c.c. in about six hours. There were three small movements containing small amounts of blood during the day. On the sixth day 32 c.c. of blood during the day. On the sixth day 32 c.c. of blood serum was given in doses of 12 and 20 c.c., respectively, with five napkins containing considerable blood and the baby's condition desperate. On the seventh day 35 c.c. in two doses were given, with three small movements containing blood. On the eighth day 10 c.c. of antistreptococcic serum and 10 c.c. of human blood serum were given, with four small bloody movements resulting. All blood completely disappeared after the eighth day. The stool was yellow with a few fine curds. 20 more c.c. were given.

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* This case was previously reported in Northwest Medical, August, 1913.

During these four days 150 c.c. of serum were given, of which 28 were antistreptococcic and 122 were human blood serum. The serum was quickly absorbed and no infection occurred. On a modified cow's milk, together with citrate of iron subcutaneously, ¾ grain every second day, she made a rapid recovery and is today in excellent nutrition.

CASE 2. Baby S. (male); full term; normal birth. Birth weight, 7 pounds, 11 ounces.

Sixth day: Baby was circumcised; penis began oozing; resutured the bleeding area.

Seventh day: Oozing continued; resutured; Tr. ferric chlorid applied.

Eighth day: Still oozing; ferric chlorid, aristole, hot applications, and still oozing continued; 10 c.c. of horse serum were given at this time; oozing continued; tannic acid was applied locally; 10 c.c. of horse serum was repeated, and again in three hours.

Ninth day: 10 c.c. of horse serum repeated; tannic acid again used with ferric chlorid without any effect.

It was at this juncture that I first saw the baby. The condition was alarming. Pallor was marked and the use of parental blood advised. The father readily consented, and about 6 ounces of blood were withdrawn, and 40 c.c. of whole human blood were injected into recipient's back at 3 P.M. At 10 P.M. there was slight oozing.

Tenth day: At 9 A.M. slight oozing; 20 c.c. of father's blood serum given in back.

Eleventh day: At 3:30 P.M. dressing changed, slight oozing; 25 c.c. of father's serum at 11 P.M. Dressing changed with considerable oozing, though 40 c.c. of horse serum was given.

Twelfth day: No oozing.

Thirteenth day: Slight color of blood; 10 c.c. of horse serum. Good convalescence.

CASE 3. Full term, low forceps. Difficult delivery. Birth weight, 6½ pounds.

Second day: Small amount of bright-red blood from rectum at 10 A.M., followed by considerable amount at 11 A.M. Put to breast and nursed fairly well.

Third day: Jaundiced; nursed well; large yellowish-brown movement with particles of blood.

At this point I saw the baby for the first time. There was a large caput, a large spot of ecchymosis on left arm. A second movement occurred, this time with considerable blood. The baby's condition was quite good, and on looking over the case, I believe that had I used human blood at this time we would have stood an excellent chance of saving the baby's life.

Fourth day: Bleeding from rectum continued and 20 c.c. of horse serum was given at 8 A.M. Each of five small movements contained blood; 20 c.c. of horse serum was repeated at 10 P.M. Subcutaneous hemorrhages appeared at numerous points on the body; some of these were of considerable size (25-cent piece).

Fifth day: Baby's face became pinched and pale; four small movements, each with some blood clots; marked inequality of pupils with sluggish reaction to light; 20 c.c. of horse serum given.

Sixth day: Baby's condition extremely bad. Evidently bleeding into the brain, as there is a constant inequality of pupils, with left pupil dilated considerably, and no reaction to light; no convulsive movements, but can't be aroused; fed with dropper fairly well; fresh subcutaneous hemorrhages appeared.

Seventh day: Left pupil dilated; no reaction; no convulsions; baby feeding poorly. Died.

In this case I firmly believe that had I used indirect transfusion on the third day, when I first saw the baby, it would have lived. The change in the next twenty-four hours was profound, with evidence of intracranial hemorrhage having occurred in the meanwhile. This outlook of an extensive hemorrhage in this location was too discouraging to warrant the inconvenience to which the father would be subjected in acting as donor. It illustrates better than any case in the series the necessity of using human blood serum early if there is any extensive bleeding, irrespective of how good the baby's condition may be at the time.

CASE 4. Full term, normal birth. Birth weight, 7 pounds, 7 ounces.

First day: Slight oozing from apparent scratch on cheek.

Second day: Group of scratches near right eye; bleeding quite freely also from lower lid of left eye; all meconium rather brown.

Third day: Vomited blood, both dark and bright, directly following a nursing of 1 ounce of water, with slight bleeding from lobe of left ear. It was at this time that I first saw the case. There was slight bleeding likewise from the mouth and left nostril, and a spot on the pillow from left ear the size of a silver dollar.

Physical Examination—A well-nourished and in every way normal-appearing infant, except for bleeding above noticed, with fine color; 20 c.c. of normal horse serum were given under the left shoulder blade.

Fourth day: Very fretful; bleeding slightly from ear, with meconium with odor and color of decomposed blood; 10 c.c. of normal horse serum given and one teaspoonful of 5 per cent. solution of gelatin each hour. Now nursing well. Color fair.

Fifth day: Stools contained few yellowish curds, otherwise dark, but without odor of blood. Normal progress.

In this case, in addition to the horse serum, gelatin solution was given hourly by mouth, as recommended by Knopfelmacher. Merck puts up a sterile gelatin (10 per cent.) which can be used 10 to 25 c.c. in subcutaneous injections two to three times daily, according to the same author. This I have never used. Many believe gelatin inert, although it has been extensively used in Europe. I have never seen any explanation of its action in this condition. There is no reason to believe that it interferes with serum therapy.

CASE 5. On the fourth day, Baby H., a boy baby, born at full term in normal labor, began to pass blood by rectum. I was immediately called in consultation and 10 c.c. of normal horse serum was given. This was repeated in the form of 15 c.c. of diphtheria antitoxin the evening of the same day, and one teaspoonful of 5 per cent gelatin solution each hour by mouth.

On the fifth day there were five movements, each containing clotted blood, and 10 c.c. more of horse serum was given.

As the baby was rather pale, and bearing in mind Baby B. and his rapid downward progress, and seeing no indication of the process subsiding, the father was induced to consent to act as donor. About 5 ounces of blood were withdrawn. 20 c.c. of horse serum was given during the early afternoon, and later 10 c.c. more of blood serum.

Sixth day: 30 c.c. of human blood serum was given at 5 A.M., 1 P.M. and 7 P.M. respectively on this day. No further hemorrhage occurred after the human blood was given on the fifth day. The Wassermann made from the father's blood was negative.

CASE 6. Baby A. At 5 A.M. on second day the baby boy aroused the mother by crying. When picked up by the nurse he was found to have saturated his napkin with blood. Clots were passed frequently and when the attending physician arrived the baby was in an extremely grave condition, with almost no pulse, with breathing associated with inspiratory dyspnea. Pallor of skin and mucous membranes was marked. An indirect transfusion was done at once, but the infant quickly died. This case I did not see until it came to autopsy. There were numerous small clots within the large vessels and many ecchymotic spots along the course of the intestine. No evidence of ulcer was found. The hemorrhage being so profuse and sudden had suggested such a possibility. Cultures taken from the heart and umbilical vessel showed a streptococcic infection. The infection was, no doubt, the etiologic factor in the hemorrhage in this instance.

Unquestionably the location of the hemorrhage, as in Case 3, intracranial hemorrhage, as well as the etiology of hemorrhage, as in Case 6, a streptococcic septicemia, must be taken into consideration in an accounting of serum therapy. In view of these facts, the mortality of 2 out of 6 cases, 33⅓ per cent., does not seem high. There were four boys and two girls. Blood serum therapy was used in some form in each case. It apparently offers the best line of treatment at present for this distressing condition, but there appears to be no reason why other forms of treatment should be entirely discarded.

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THE PHYSICIAN AND CHILD LABOR*

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Referring to the physical effects upon children of premature labor in Italy, Mosso says: "The ruin which the exhaustion of fatigue brings about in men appears clearly in the degeneration of our race in some parts of Italy. In the Province of Caltanissetta, for example, in the four years from 1881 to 1884, out of 3,672 sulphur workers, youths of twenty years of age, who presented themselves for examination, only 203 were declared fit for military service."

In the United States, also, bad conditions still exist. The report of the investigation made by the United States Commissioner of Labor into the conditions surrounding working women and children show that of the employees in the cotton textile industry, 5.2 per cent. in the Northern mills and 20 per cent. in the Southern mills are children under sixteen. In two states mills were found regularly exceeding the legal limit of work hours. Eleven mills were found in various states "stealing time" by beginning before the hour scheduled in the morning and at noon. Seven mills required overtime work, three of these from children as well as from women. In North and South Carolina thirty-two mills employed 549 children from eleven and one-half to twelve hours a night for five nights in the week. What will be the ruin wrought upon these children by the exhaustion of fatigue? The same report referring to mortality among cotton mill operatives shows that the child who works in a cotton mill has only half as good a chance to live to be twenty years old as the child outside the mill, and the 1910 Census reports 41,000 child operatives in the cotton mills of the country. The enormously high proportion of deaths from tuberculosis among the cotton mill operatives led to an extensive study of this particular hazard. Approximately one of every two deaths between fifteen and forty-four years of age was found to be due to tuberculosis. In every age period for either sex, except among males thirty-five to thirty-nine years, the ratio of deaths from tuberculosis is higher among cotton mill workers than among the rest of the population, rising to five times as great among women operatives thirty-five to forty-four years old.

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*Read before the New Jersey State Pediatrics Society, Spring Lake, N. J., June 21, 1915.

In 1914 more than 33,000 children between fourteen and sixteen years of age obtained work permits from the Board of Health in New York City; 1,400 other children were denied permits; 861 of these because of physical incapacity. Recently the children applying for work permits in Philadelphia were examined to determine whether or not they were physically fitted to go to work, and hundreds were found entering industry suffering from disease and deformities which would be aggravated by bad labor conditions and seriously handicap them in their struggle for a livelihood.

Dr. Ludwig Teleky, of Vienna, has gathered statistics showing clearly the increase of disease among children who leave school to go to work. The extent of disease increases with the number of years devoted to work. Medical books declare that boys should be given no work which causes physical strain or in which the posture is not frequently changed, but after many years spent in visiting industrial establishments in Vienna, Teleky found only two such occupations available—landscape gardening and forestry—and these two fields of work did not offer enough positions in Austria to give employment to the underdeveloped children found in a single one of the working class quarters of Vienna. After studying the problem at first-hand and seeing all efforts to prevent the disastrous effect of labor on underdeveloped children fail, Teleky advises no remedy save the raising of the age limit for employment to sixteen years.

The Maryland Bureau of Statistics and Information at Baltimore requires applicants for work permits to submit to physical examination as a condition for the granting of the permit and the report of this Bureau showing the serious diseases and defects found in many of these applicants is very significant.

But, as a matter of fact, we know very little concerning the physical effect of child labor. The child labor reform movement has been based largely upon common sense and upon the results of investigations made into the conditions surrounding given groups of children in given places at a given time. Such investigations are valuable for showing the conditions at a given time, but they do not offer any proof as to the physical effects of any form of toil, because the children examined may have been afflicted in the same way before they entered upon any gainful employment. The New Jersey Child Labor Law as amended in 1914 offers a splendid opportunity to the medical profession of the state for a study of the physical effects of work upon children between the ages of fourteen and sixteen years. Boys and girls of these ages are required to obtain the work permit of the school authorities before entering upon gainful occupations, and this permit is granted only upon proof of age, completion of the fifth grade at school and physical fitness as determined by an examination. With reference to the proof of physical fitness, the law says that the child, upon applying for the work permit, shall appear before a medical inspector, employed by the Board of Education, who shall examine said child and file with the Supervisor of School Exemption Certificates a certificate signed by said medical inspector describing the physical condition of said child and certifying as to whether such child has the normal health of a child of its age and is of sufficiently sound health and physically able to be employed in any of the occupations in which a child between fourteen and sixteen years of age may legally be employed. The fact that a permit is valid for only one job and a child must return to the school authorities for a reissuance of the permit every time he changes positions, affords an opportunity during these two years to follow the child's industrial career and to re-test him physically from time to time. This opportunity is open in every community and if such a progressive study of a group of children could be made to covered at least two years and preferably five years, the results would be of great value in determining just what should be the provisions of protective legislation for children in industry. The Federal Government reports that of all the children between fourteen and sixteen in New Jersey, 27 per cent. are engaged in gainful occupations. Is their work beneficial or detrimental? The physicians of the state must answer this question sooner or later.

AN UNUSUAL CASE OF EPIDIDYMO-ORCHITIS IN AN INFANT

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As is well known, gonorrhea in male children is much less frequent than in female children, and complications of the disease are seldom met with. Text-books speak of the rarity of complications and especially any involvement of the epididymis or testicle.

In reviewing the literature since 1900, we have found comparatively few such cases reported.

In 1901 Wolbarst[1] reported 22 cases of gonorrhea in male children, ages eighteen months to twelve years. He states that complications similar to those seen in the adult may arise, but does not mention that they occurred in any of his cases.

In 1903 Lowenburg[2] reported a case in a boy, aged four years, accompanied by balanoposthitis and retention of urine.

In 1905 Holt,[3] in an article dealing with gonococcus arthritis in children, mentioned 19 cases occurring in the male, none of which had any involvement of either epididymis or testicle.

In 1905 Rudski[4] reported 3 cases without complications, aged nine to eleven and one half years. He also collected from the literature 49 cases, and of these 2 had epididymitis, one an infant of fifteen months, and the other a child of twelve years.

In 1906 Frasier-Harris[5] reported a boy of fourteen years with gonorrheal urethritis but no complications.

In 1906 Plomley[6] reported 16 boys with urethritis, and in 6 found the gonococcus. The youngest of these cases was twelve months, but the ages of the other cases were not given. None of these cases had complications.

In 1909 Pollock[7] reported a case in a boy of six years, without complications.

In 1910 Wolbarst[8] in another article reported 37 cases, adding 15 to those of his first report, of specific urethritis in male children. Five of these were under two years of age; the youngest sixteen months and the oldest fourteen years. He notes that in these 37 cases there were no complications.

In 1910 Schweitzer[9] reported a case without complications in a nine-year-old child.

In 1913 Smith and McKee[10] reported a case in a boy aged seventeen months.

In 1914 Bieberbach[11] reported brothers, aged three and six years. There were no complications.

In 1914 Reinhard[12] reported a case in an infant delivered from a mother having gonorrhea. At the end of two weeks the child developed a urethritis, and twelve days following an epididymitis. This case terminated fatally six days later. This observer has been unable to find any similar case in literature.

In summarizing the literature since 1900 we find, of 132 cases reported, but 3 cases had epididymitis—the unique case of Reinhard, a three-weeks-old infant, and the 2 cases collected by Rudski, ages fifteen months and twelve years respectively. Most of these 132 cases were found in older children.

CASE. R. N., male infant, aged three months, was admitted to the hospital on November 7th for regulation of feeding. The physical examination was negative, the genitalia appearing normal. No bacteriologic examination was made. On December 27, at which time he was four and one-half months of age, it was observed that the left scrotum was reddened and swollen, and that the left testicle and epididymitis were enlarged and tender. The other parts seemed normal; the temperature, 98.6°. The day following, the temperature rose to 100°, and next day 103°. With the application of cold the redness and swelling diminished and the temperature fell to normal five days following its initiation. On January 8th there was noted at the urethral orifice a white purulent discharge; the bacteriologic examination of which showed Gram negative diplococci, intra and extra cellular, in great numbers. At this time the testicle and epididymis were palpably enlarged, the scrotum somewhat swelled, not reddened, and the temperature normal. The discharge persisted for several days. On January 15th the patient was removed to the venereal ward of the Philadelphia General Hospital. At the time of removal the patient's general condition was good. Through the Social Service the case was traced, and up to three months from the time of leaving the hospital showed no further discharge. The testicle and epididymis at this time seemed normal. No history of a discharge in any member of the patient's family could be obtained, but no definite examinations were permitted. With the exception of Reinhard's case, this patient is the youngest, so far as we know, reported in the literature. From this case a small epidemic arose in the same ward of 4 girl infants who previously had no discharge and negative smears developed discharge positive for gonococci.

We are greatly indebted to Dr. J. P. Crozer Griffith, on whose service at the Children's Hospital the case was admitted, for permission to report the case.

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11. **Bieberbach. Boston Medical and Surgical Journal, 1914, Vol. CLXXI., p. 351.**
12. **Reinhard. Münch. Med. Woch., 1914, Vol. LXI., p. 497.**

SYMPTOMS IN AMAUROTIC FAMILY IDIOCY—The symptoms mentioned by Coriat (Boston Medical and Surgical Journal, July 1, 1915, Vol. CLXXIII., No. 1, pp. 1-36) are: Explosive laughter: This symptom was noticed in 3 cases. In 2 of these the mental deterioration was marked. Hydrocephalus: This was present in 1 case. Bulbar symptoms: This was present in 1 case and was shown by drooling of saliva, choking spells, difficulty of swallowing and attacks of apnea. This child died suddenly from bulbar paralysis. Nystagmus: Constant lateral and rotary nystagmus was present in 3 cases, in 1 of which it persisted during the entire course of the disease. Hypotonia: In 2 cases there was a marked flaccidity of the limbs, resembling the condition seen in amyotonia congenita. Abnormal reflex phenomena were noted.—*Journal of American Medical Association.*

SOCIETY REPORT

CALIFORNIA PEDIATRIC SOCIETY

Regular Meeting, April 22, 1915

Dr. Lewitt, President, in the Chair

The following scientific programme was rendered:—

A SYNOPSIS OF A STUDY OF THE MIDWIFE SITUATION IN SAN FRANCISCO

Adelaide Brown, Chairman for Pacific Coast of the Committee on Obstetrics of the Society for the Study and Prevention of Infant Mortality, read this paper.

This study was based on the records of the San Francisco Department of Health from August, 1913, to August, 1914.

Total number of births registered by midwives	1,263
“ “ “ “ “	7,200
“ “ “ midwives registering births	82
“ “ registering less than five	37
“ “ “ one only	27

This leads to the conclusion that midwives register fairly well, which is the opinion of the Health Office, and care for $16\frac{2}{3}$ per cent. of the cases in the city. Nine midwives registered over 50 cases apiece. They were either Japanese or Italian. As to mortality during the year, no case dying of puerperal sepsis corresponded to registration of birth under a midwife. Morbidity could not be investigated.

The Japanese midwives interviewed expressed surprise that no registration or examination of midwives was required in this city. Their regulations in Japan were obtained from the Japanese Consul. They practice among the Japanese, one recording 80 and another 55 cases. They were reported to be neat, capable and interested women.

No attempt was made to interview midwives registering less than 5 cases. In all, 33 midwives were seen—divided as follows:

NATIONALITY	NUMBER	CASES
Italian	18	732
Swedish	1	4
German	5	15
Slavonian	1	24
Hungarian	2	40
Japanese	3	116
Russian	1	6
Swiss	2	63
	33	996

This total of 996 cases covers five-sixths of all the cases recorded by midwives.

Conclusions based on these interviews cover the problem in San Francisco:—

(1) The question of the midwife is a problem of immigration. No American-born woman among those practicing in San Francisco.

(1) It is also an economic question. The average fee is $10 to $25 and covers confinement and a nursing visit daily for ten days, *i.e.*, postpartum care to mother and child.

(3) The education of the midwife varies from thorough, as with the Japanese and Italian (in part), as evinced by answers to questions and general impression of investigator and success in work, to utter disregard of any modern ideas—untidy homes, etc.

(4) The living made by a midwife is at best precarious. Based on a charge of $15 each, a practice of 30 cases a year would be necessary to secure a living wage of $8 a week, or $415 a year. Of the 82 midwives recording births, only 13 record over 30 births each.

The solution of this problem:—

(1) Standardize training and equipment of midwives.

(2) License and renew licenses annually by Board of Health.

(3) Follow-up care by a "baby hygiene nurse" employed by the Board of Health of all cases registered on "Care of the Baby."

(4) Give some substitute for the midwife, in care at home

for the mother and child, which is not a charity and the self-respect of the family is not hurt by accepting it. The establishing of a grade of attendant for the sick, including bed care, care of baby and household, would do much to solve the midwife question. A year or nine months' training and a wage of from $10 to $15 a week would help to solve the problem which all sickness is to the small wage-earner's family.

A SYNOPSIS OF A STUDY OF THE MIDWIVES OF ALAMEDA COUNTY

Marian L. Stebbins, of the Baby Hospital of Alameda County and the Baby Hygiene and Certified Milk Committee of the Collegiate Alumnæ, read this paper.

In Oakland:—

Total number of births registered by midwives 329
“ “ “ “ “ 3,025

Of these:—

NATIONALITY	NUMBER	CASES
Japanese	1	58
Italian	5	142
Swedish	1	22
Finnish	1	5
Scotch	1	8
	—	—
	9	235

One woman was reported as very poor. Four midwives were graduates of two-year schools. Several held diplomas of 1870-1875. In Berkeley:—

Total number of births registered by midwives 103
“ “ “ “ “ 812

Two Japanese and one Finnish, graduates of two-year schools, do half the work.

In Alameda the same conditions prevailed.

To summarize the foregoing facts we find:

(1) That our midwifery situation on this side of the bay is very largely confined to the foreign population, principally Italian and Japanese.

(2) That over 50 per cent. of the births registered by midwives are in the hands of five or six midwives, who have had two years' training in good schools, and who have, in consequence

of this training, and as a result of their large practice, that experience which is one of the necessities for good obstetrics.

(3) That with one exception, these women are under thirty-three years of age, and hold diplomas of as recent date as 1901-1903, indicating that they are abreast with the more modern theory and practice of obstetrics. These young women were the only ones of all the midwives investigated who understood prophylactic treatment of gonorrheal ophthalmia and habitually used argyrol or nitrate of silver in the eyes of the newborn infant.

The fees asked by midwives varied from $10 to $20, and this amount covered not only attendance in labor, but daily nursing care for mother and child during the lying-in period of ten to fourteen days. Fifteen dollars was the usual fee asked by the more professional midwives.

It is not within the scope of this report to discuss the arguments for and against the existence of midwives. The fact is that they do exist, and that they appear to meet a very real social and economic need. A state-wide system of examination, license and supervision, while it would not be entirely effective—few legal means are—would yet meet the more serious difficulties of the present situation, as it is found in these bay cities, and doubtless elsewhere; it would place those midwives whose ignorance and carelessness are a menace to the community outside the pale of the law, and give to the well-trained and competent a secure basis for their work.

NOTE—The above investigations were made independently and the conclusions were at no time a matter of conference.

DR. FRANCES SAGE BRADLEY—I am not familiar with conditions in this part of the country and, of course, corrective measures must vary to meet local needs. But I believe that in the Southern States, from Virginia to Florida, and in the Gulf States, from Florida to Texas, midwifery has come to stay. As long as women are women they will render this service to sisters in distress. We cannot hope to eliminate this class, but by state or local legislation we can do much toward its control and supervision.

In the South we do not have the immigration proposition of the East and West, but we have the negro proposition in much greater proportion, from one-fourth to three-fourths of many

Southern cities being colored. This offers, perhaps, as many difficulties as your foreign element. In cities such as Atlanta, Birmingham and New Orleans, where negroes are educated, and even in Charleston, Savannah and Mobile, with ignorant negroes, much progress has been made by supervising them and training them in safer, cleaner midwifery.

Personally and professionally, I would sooner trust an intelligent, supervised midwife than the $5 doctor, who is her usual substitute.

In Jacksonville, Fla., I found excellent supervision and control of this problem. The City Health Officer and County Medical Society give a course in theoretical and practical midwifery to classes of 12 and 15, training them in personal cleanliness, in aseptic care of the patient, and, above all, in the principles of non-interference. They are instructed to call for help in all protracted or difficult labors. They are required to wear white turbans, aprons and wash dresses and are supplied with sterile cases containing nitrate of silver with dropper, cotton, gauze, etc., for dressing the cord.

After passing the examination and delivering 10 cases under supervision, they are allowed to practice as long as their work is satisfactory. At the first indication of tetanus, which is extremely common among negroes, of ophthalmia, of puerperal infection or other results of careless work, the license is revoked and the midwife compelled to take a second course of instruction.

I want to read you a letter which was received by the Jacksonville Board of Health recently from a midwife whose license had been taken from her. The spelling and composition expose her limited education, but the tone of the letter reveals a spirit amenable to control and regulation:—

Nov 8 1914
Jacksonville Fla

to The City Board of health

My Sir i have to Cases on hand and you told Me What to do so please tell Me Just What and What Wants at once doctor i Would not dare to togh Them Whithout you said doctor i am Way Back My Rent is Way Behind So please loose Me and let Me no what to do and about the BaBy dieing it Was The Way The BaBy people use it Because i did My duty By it So Please turn Me loose So i can do Something doctor please loosen

Me Because i have not Got no husband to do for me i have to do for MySelf & Please Give Me the nurse address So as i Will no When to call her up and The first child That i ever Caught has lived to Become 22 Years old and i have Not had No Bad luck at all Before Now doctor Please let Me Go have Mercy on Me Because i am about to Be Put out hoping to Go Get a answer soon

from Lizzie Cofield

The women are illiterate, but take great pride in holding what they consider a city office and feel the loss of their licenses as a real degradation. It is perfectly possible to regulate the practice of midwifery among these people.

In Atlanta and Birmingham we are placing more of the responsibility upon the negroes themselves, because they are of a more educated type. Senior students of colored colleges and universities investigate and report on the work of midwives; churches and other philanthropic organizations are encouraged to place trained nurses at the disposal of their members for obstertical service. Instead of eliminating the midwife, it is hoped in this way gradually to substitute the trained for the untrained woman, and to reach a solution of the problem of midwifery.

THE PROPER POSITION OF TONSILLECTOMY IN PEDIATRICS

Dr. Sanford Blum read this paper. (See p. 817.)

Dr. Welty—Dr. Blum's array of cases is simply remarkable; I can scarcely conceive that so many bad operations have been done. Nevertheless, it is a fact; in all new procedures many cases are more or less mutilated.

Dr. Blum should have given a different title to his paper, such as "The Far-reaching Results of Incomplete Tonsillar Operations." There is no doubt in my mind as to the good effects of tonsil and adenoid enucleation. At the same time, there should be well-recognized, classical indications for tonsil and adenoid operations. If such indications were well established and recognized, there would not be so many operations. In my criticism I shall confine myself to children under fourteen years of age. The most important indication of all is recurring acute otitis. In fact, it is so important in my mind that I recommend tonsil and adenoid enucleation after a single attack, recognizing full well that the ear condition originates more frequently from the adenoid than from the tonsil. While the tonsil more frequently produces cervical adenitis, endocarditis and various infections, on the other hand, impaired hearing is the outcome and it is such a handicap that the entire life of the individual is a disappointment to himself as well as to his friends. I say this is the most important indication because it means so much in the entire life of the individual.

Cervical adenitis, whenever found, should be operated at once. Arthritis and rheumatism, chorea as well as endo- and myocarditis, also malnutrition in individual cases, I include in a single group of infections that may take place by way of the tonsil and adenoid.

Mouth-breathing, snoring and lack of facial development are of secondary importance in comparison. If you do accept such as indications for operative interference, there can be only one thing that is wrong, and that is the technique of the operation is faulty. I must admit that at times it is faulty in the best of hands. This occurs so seldom that I am inclined to speak of it as carelessness in the hands of the experienced operator.

It is a fact that the whole group of infectious diseases are less frequent in cases that have had the tonsils and adenoids removed. It is a fact that should you have an acute otitis during an infectious disease it is less likely to involve the mastoid, so that an operation is necessary. On the whole, I have only seen good results from operative interference.

Dr. Walker—Dr. Blum has injected the cervical glands with a chemical and has recovered it in the tonsils. He says this means that the tonsil is an excretory organ for the cervical glands. I think probably if Dr. Blum would inject the tonsils with this same chemical he might recover some of the chemical in the cervical glands as well. The result he gives with this experiment is not conclusive to me. It seems to me that it is not in keeping with nature's usual placing of excretory organs, either in the human anatomy or in any lower animals. To place the excretory organs where the excreta would be dumped into the opening of a canal for ingestion of food, or near the intake of air, would be a poor place for the placing of excreta, so poor that I would feel competent to say that it had better be rearranged by the removal of such excretory organs, but I am far from believing that it is an excretory organ.

Dr. Blum, I believe, has observed 100 cases in which he advised 2 tonsillectomies, and 20 others out of the 100 had tonsillectomies done without his knowledge or advice, but I do not call them all tonsillectomies from what he tells of the tonsils having re-grown. I knew that we could amputate a part of some of the reptilia and the part would re-grow, but I did not know that we could remove a part of the human body and have it reproduced to the extent that he describes. I would rather say that these cases of the returned tonsils he mentions need a good tonsillectomy, and I think all of their troubles with which their tonsils have anything to do would disappear. He mentions seeing chorea in a part of these cases; well, we have all seen chorea in a great many people who have not had tonsillectomies or tonsillotomies. He mentions petit mal and asthma in some of these cases. We know that asthma is a symptom-complex, often having one cause and often another, and the diagnostician is very fortunate who can always find the cause. As for the petit mal, the throat condition probably had nothing to do with it. If the tonsil is so important an excretory organ as Dr. Blum says, why did he have them sacrificed in these 2 cases. He recommends adenectomy. Tonsils and adenoids are absolutely of the same make-up. Why sacrifice one part of it and leave the other? Of course I know he would probably say that adenoids are more directly in the respiratory tract, and truly, but if there is usually to be seen about the tonsil an area of inflammation radiating from the tonsil which is usual in these hypertrophic tonsil cases; if there have been attacks of aural catarrh; if there are deep tonsil crypts containing epithelial debris, remove the tonsils.

We can all produce many hundreds of case histories showing direct improvement and no harm from a good tonsillectomy. He mentions in many of these 20 cases operated on results which are inexcusable, damage to the uvula for which there is no excuse, cicatricial bands, which is the result of bungling work, and hemorrhage, which, of course, can be controlled, as we can ligate any bleeding vessel, or often close the whole wound with suture and prevent hemorrhage even in a bad bleeder. He mentions many cases that are nervous; of course, he has not told us what is the matter with them in stating that they are nervous.

To be sure we should not operate on anyone without a good reason, as giving an anesthetic to a person is something that should never be done unless it can be justified, but the danger from a tonsillectomy is not nearly so great as the danger from bad tonsils. The tonsils are simply an aggregation of a lot of connective tissue covered by mucous membrane which is folded down through it in places, producing crypts and sulci, and the only glands are the glands of the mucous membrane. An enlarged tonsil is only a disease product and not a functionating organ any more than an aggregation of hemorrhoids is.

DR. PHILIP KING BROWN—I cannot let this opportunity go to say a few things about this subject from the point of view of the general practitioner. It is now eighteen years since I first discussed this question of tonsillar infection and I have been very much interested in it ever since, having written about it two or three times. Today I feel about it as I did in the beginning, only I am ready to take into consideration the teeth with the tonsils. I do not believe it is worth while talking about tonsils in any person's mouth, from the age of one year to sixty, unless you consider, at the same time, whether or not the teeth are healthy. To remove tonsils that are slightly diseased, in the presence of very badly diseased teeth, is, to my mind, one of the most ludicrous procedures in the world. To remove teeth that are badly infected sometimes reveals what may have been the cause of the constitutional disturbance attributed to the tonsils. I have seen a very remarkable instance of that in a young woman of thirty who was under the care of a stomach specialist for a long time. Finally she had her abdomen opened for ulcer of the stomach. No ulcer being discovered, the surgeon took out her appendix and sewed her up. She became pregnant after that, developed pneumonia, and after that asthma and in the year since she had five attacks. I examined this woman and found that she had such bad teeth that I immediately advised her to have her jaws X-rayed. She had an abscess around the root of a tooth on one side, pyorrhea of the front teeth and an overlooked root, also the cause of an abscess in the other jaw. I took her to Dr. Sharp who removed both of those teeth. Within ten hours she had an acute otitis media due to the streptococcus viridans which probably caused all her intestinal infection. It might also have been the source of her pneumonia, and probably of asthma. I do not believe she will ever have asthma again, and the minor sore throats, which I did not mention, but from which she suffered during all this time, I have no doubt, also will disappear, without tonsillectomy.

Dr. Yerrington—The only way to clear up a subject like this is to look carefully into the histories of possibly 500 or 1,000 cases which have been operated on in one clinic and have them followed up. The children could be brought back to the clinic and the result of the tonsillectomy noted.

Dr. Blum has followed up his cases very carefully but he has not reported enough cases to give us any definite conclusions.

I was very glad to hear Dr. Brown speak about the teeth. I think at least eighty per cent. of the children I see in the clinic have bad teeth. When these are properly attended to we often see a reduction in the size of the tonsil, and a decrease in the glandular involvement.

Dr. Adelaide Brown—I would like to suggest one point in discussion. In studying tonsillar children, Dr. Blum takes 100 unoperated cases from private practice, which probably means children under a high-grade type of physical care, food, hygiene, etc., of the best class, which he compares with 100 cases drifting into the Polyclinic practice. I think you have to compare groups of cases from the same class. The Polyclinic child is not ideally surrounded. It very often comes from a dirty home environment, with dust, dirt, and bad habits of thumb-sucking and all that sort of thing. I think parallel groups of children should be compared.

Dr. McCleave—I might say a word about Dr. Blum's paper, largely what others have said. It does seem to me unquestionably true that we cannot compare two sets of cases such as he has advanced. Furthermore, it seems to me that while I did not count the cases as he recited them, I was struck with the very large number of what he designated "recurrences of the tonsils, tonsils regrown, tonsil tissue in the throat." As he read those cases, it sounded more to me like the recital of poor surgical results, rather than the recital of effects occurring after tonsillectomy. By his own statement, tonsillectomy was not accomplished in these cases. Dr. Blum says he recited these cases and these after-effects to you, and that he is satisfied with the result of his own procedure. I also have recited cases and also am satisfied with the results of my procedure. And my patients are satisfied, because as I said, one man told me he was saving two hundred dollars a year on me, and I assure you there are many others. But my tonsillectomies are tonsillectomies. I think that makes a difference.

In regard to co-operation of physicians and throat specialists, I think one of the most important duties of the family physician is to advise that the proper operator do the operation. Very many of the cases that come to us are the miserable results of poor work, and while most of the specialists in this line of work are doing it properly, unfortunately there are still many men attempting tonsillectomy who do not know anything about the operation. It is unquestionably the duty of the family physician to see that it is done by the proper man. If it is not done properly, you cannot expect results.

I was interested in Dr. Brown's remarks about the teeth because the title of my paper was "The Relation of the Mouth and Throat Infections to Disease in Other Parts of the Body," and I intended to speak of the teeth, but for the purpose of not making my paper too long, I omitted this. Dental infections may cause sequelæ similar to those of tonsil infections.

DR. BLUM—I wish to clear up the matter to which Dr. Horn called attention: that this paper with the report of cases might be construed as reflecting on San Francisco colleagues. Such is not the fact. The first case that I reported, I was careful to say, was operated on in New York. Some of the cases were operated in Oakland. Some were operated in San Francisco. The records are available. I have criticised no individual, but have criticised the procedure. I have reported the actual results that I have seen in these 200 cases.

In reply to Dr. Adelaide Brown's remark, that clinic cases may be expected to have worse results than private cases, this has not been my experience. The worst results of tonsillectomy that I have seen occurred in private cases. For example, take the case of a child in a wealthy family, operated on two years ago by one of the foremost laryngologists here. The child had always been well. The Wassermann and tuberculin tests were negative. Tonsillectomy was performed; now, two years later, the child has tremendously redundant lymphoid masses in the pharynx, and the child has epilepsy.

In reply to Dr. Walker as to it being the inefficient and incapable operator who gets these bad results, this is the usual statement of the laryngologists. If it were not a violation of confidence, I would take great pleasure in showing you a letter that I received in response to my set of questions. It is from one of the high standing physicians of San Francisco, who is connected with a large hospital, and he not only answers my questions, but writes me a letter stating that in the hands of skillful operators there are no bad results. However, one of the cases I reported was operated by that doctor.

The cases from the clinic and from my practice I reported fully for one reason: I wanted to conceal no case, to state every case as it was. In medical procedures we judge by results. I have reported results.

The other questions raised require no further comment from me, as they have been already answered in my paper.

RELATION OF MOUTH AND THROAT INFECTIONS TO DISEASES IN OTHER PARTS OF THE BODY

DR. T. C. MCCLEAVE read a paper by this title.

CHOREA—Bonola (Policlinico, Rome, June 13, 1915, Vol. XXII., No. 24, pp. 785-820) reviews the evidence as to Sydenham's chorea being of organic nature, supplementing the testimony of others by his own study of 22 cases. In 9 in this group there had been general febrile phenomenona before the onset of the chorea; in 5 the children had had acute articular rheumatism and 2 had been subjected to a severe fright, after which the chorea had developed suddenly. There was concomitant heart disease in 13 cases and in 6 the chorea had recurred. The reflexes were exaggerated in 14 of the 22 cases and 7 presented Gordon's tonic reflex, that is, the rapid elevation of the leg when the patella tendon is struck, the subject reclining on his back. The leg returns very slowly to its former position. It is equivalent, therefore, to an exaggerated reflex. The most significant testimony to the organic nature of chorea are signs indicating irritation or degeneration in the pyramidal tracts or cerebellar apparatus. He found evidences of such in many of his 22 cases, as he describes in detail, comparing his percentages with those in the literature. His final conclusion is that the evidence all tends to prove that some special affection of the nervous system is the organic basis for chorea.—*Journal of American Medical Association.*

DEPARTMENT OF ABSTRACTS

ORIGINAL CONDENSATIONS OF CURRENT PEDIATRIC LITERATURE BY THE EDITORS AND THE FOLLOWING ASSOCIATES

T. Wood Clarke..........Utica, N. Y.
Coleman W. Cutler.....New York City
Charles E. Farr.......New York City
Morris Friedson.......New York City
Gaylord W. Graves.....New York City
Jerome S. Leopold.....New York City
William Lyon..........Jackson, Mich.
Stafford McLean.......New York City
Carlo D. Martinetti......Orange, N. J.
Raymond B. Mixsell....Pasadena, Cal.
Rudolph D. Moffett.....New York City
Willard S. Parker.......Boston, Mass.
Mark S. Reuben.......New York City
Mills Sturtevant.......New York City
Samuel W. Thurber....New York City
Eugene F. Warner.....St. Paul, Minn.
Edwin T. Wyman.......Boston, Mass.
J. Herbert Young.......Newton, Mass.

HIGGINS, T. TWISTINGTON: OVARIAN SARCOMATA IN CHILDREN: AN ACCOUNT OF THREE CASES. (The British Journal of Children's Diseases, June, 1915, p. 161.)

The author reports 3 cases, 2 of which recovered after operation, in girls of five, ten and seven respectively. All 3 showed practically the same signs. A detailed description of the girl of five follows: Six weeks previous to admission to the hospital a swelling was noticed in the lower abdomen which had steadily increased in size. She suffered from colicky pain and some constipation. During the week preceding admission her symptoms became more pronounced; she vomited, was feverish, and blood was passed in small quantities *per vaginem.* Her previous health had been excellent. On admission her temperature was 102° and pulse 130. The tongue was dry and furred. A large swelling occupied the whole lower abdomen, extending upward beyond the umbilicus. This swelling was very tender and the overlying abdominal wall rigid. It was dull on percussion, and catheterization made no appreciable alteration in the physical signs. *Per rectum* a firm, smooth mass could be felt occupying the middle line. A laparotomy was performed and the mass was removed. It weighed 3½ pounds and had attached to it a portion of the left Fallopian tube. No trace of the normal ovary was present. The surface was smooth and glistening, with here and there small cysts containing a blood-stained serous fluid; apart from these the consistency was firm. On section a diagnosis was made of mixed-celled sarcoma, mainly round-celled. These 3 cases illustrate certain aspects of the disease, namely, the insidious onset, with unexplained colicky pain; later, the appearance of a mobile lump, with possibly some precocious menstruation; the steady enlargement of the abdomen, with pain and fever; the result of an adhesive peritonitis, occurring on the surface of the growth, and, finally, the tendency to spread, by direct extension, along lines of adhesion rather than by metastases. The disease is ordinarily a very fatal one, the author's experience being unusually happy. H. R. M.

PATON, LESLIE: MONTESSORI EDUCATION FOR CHILDREN WITH DEFECTIVE SIGHT. (The British Journal of Children's Diseases, May, 1915, p. 129.)

Mr. Paton's attention was first called to the value of the Montessori system of education by a patient, aged two and one-half years, with blindness in the left eye and very defective vision in the right eye. So much improvement was shown by this case under six months' training that the author advocates the system for young patients with ophthalmological disabilities. He devotes considerable space to the method itself and states that for visually defective children some slight modifications would be necessary in some parts of the apparatus. In learning numeration, for instance, the long stair, instead of being made in alternate colors, blue and red, would have to be made with alternating rough and smooth surfaces. Sand-paper figures would have to be used in the counting boxes. Frames and blocked sandpaper letters would have to be used in forming words, but so efficiently are the tactile muscular and stereognostic senses developed that it would be possible to get a blind child to write on ordinary paper, keeping a moderately straight line, without the use of any of the mechanical devices which most of them have now to use. H. R. M.

GELLHORN, WALTER: CASEIN-MILK FEEDING IN INFANCY AND CHILDHOOD. (Journal of the American Medical Association, September 4, 1915, p. 853.)

The author reports 13 groups of cases which were successfully treated with casein-milk. His conclusions are as follows: Casein-milk feedings have been found to be successful as temporary food in *allaitement-mixte* and whenever it was necessary to wean a very young child abruptly. Although they do not seem to produce any harm during prolonged use, the advantages they offer are not sufficiently clear to recommend their substitution for the ordinary milk modifications. They are indicated in disorders of a fermentative origin, and can be fed here in rapidly increasing doses regardless of the stool picture, provided the child does not develop symptoms of alimentary intoxication. Through their use may be avoided the prolonged or repeated therapeutic hunger periods, with their deteriorating influence on the child's organism, which are so frequently the cause of turning an originally mild into a serious disorder.

H. R. M.

FRIEDBERG, STANTON A.: UPPER BRONCHOSCOPY FOR A FOREIGN BODY IN AN INFANT THREE MONTHS OLD. (Journal of the American Medical Association, May 15, 1915, p. 1,654.)

An infant three months of age in some manner introduced a closed safety-pin into her mouth. About all the history obtainable was that the accident was followed by the appearance of some frothy secretion, after which the child fell asleep. She was very restless and could not cry aloud. On this account she was taken to a hospital and an unsuccessful attempt was made to remove the pin. A Roentgenogram showed the pin with the closed end downward about the level of the sternal notch. There was no trouble in nursing nor any marked respiratory distress. The temperature was 101°F. The bronchoscopic tube was passed through the larynx, and the pin was seen at the lower end of the trachea, its lower portion projecting into the right main bronchus. It could not be removed through the small tube, so they were brought out together. No anesthetic was used, there was only a slight rise in temperature, and the voice returned the day following the operation. The author reports this case to emphasize the fact that tracheotomy is not necessarily indicated for the removal of foreign bodies from the air passages in infants and young children.

H. R. M.

ASHBY, HUGH T.: A CASE OF MYELITIS IN A CHILD. (The British Journal of Diseases of Children, May, 1915, p. 142.)

The patient, aged five and one-half years, was gradually losing the use of his legs, and on admission to the hospital was quite unable to move them. Family history was negative, and previous to the onset of the illness he had always been healthy. No infectious diseases. There was complete paralysis of both legs and back, with anesthesia extending from the toes up to a line drawn round the chest just below the nipples. The knee-jerks were much exaggerated, and Babinski's sign was present on both sides. The abdominal reflexes were absent. There was no optic neuritis and no impairment of the mental power. The upper extremities and neck were unaffected. The urine was normal, but there was constant dribbling. Incontinence of feces was marked. There were vague pains in the chest and upper abdomen, but his general condition remained the same till just before he died. Temperature was normal throughout the illness. Heart and lungs were normal. After three weeks the anesthesia which had remained at the same level began to increase upwards, and he became rapidly worse, the vital centers becoming affected. No postmortem examination was obtained. The unusual part of this case was that it *did not* follow one of the infectious fevers, as most cases of myelitis in children do. There was no improvement with potassium iodid, no family history of syphilis, and the Wassermann test was negative. There was no spinal caries or injury, and the case was quite unlike anterior poliomyelitis or a spinal growth. H. R. M.

HESS, ALFRED F.: INFANTILE SCURVY. A NEW ASPECT OF THE SYMPTOMATOLOGY, PATHOLOGY AND DIET. (Journal of the American Medical Association, September 18, 1915, p. 1,003.)

Dr. Hess draws some very interesting conclusions from cases of scurvy in the Hebrew Infant Asylum, in some ways differing from Barlow's classical account of the disease. He maintains that the pathology of infantile scurvy is too much devoted to a description of the lesion of the bones, little or no mention being made of the heart, the lungs and other internal organs. In several of the author's cases definite enlargement of the right heart was ascertained by physical signs, X-rays, and, afterward, necropsy. Edema also should be more emphasized. This occurs early in the disease and involves most frequently the eyelids. It is often manifested as a firm edema over the lower end of the tibia, infiltrating the skin, and is readily overlooked, as it does not pit on pressure. This extravasation, which is due to nutritional disturbance of the smaller vessels, may also infiltrate the muscles. When this occurs in the thigh and causes swelling it may be mistaken for the typical periosteal hemorrhage. The nerves also are involved, as the knee-jerks are increased, and there are indications of superficial tenderness of the limbs and neuro-edema of the optic discs. In view of these facts scurvy assumes actual relationship to beri-beri, in which the right heart is also hypertrophied and the nerves invariably involved. This correlation was emphasized still further by a dietetic test modeled after the treatment of beri-beri, which is brought about by a diet of polished rice which has been deprived of its pericarp, and is cured by the addition of rice polishings to the diet. In the author's series of cases the addition of middlings—the pericarp of the wheat—caused in many instances a prompt amelioration of the symptoms, although it did not cure the disease. This is indicative of the advantage of giving a cereal which contains the outer layers of the grain when the diet includes no other antiscorbutic food. H. R. M.

WEST: C. E.: CASE OF TUBERCULOSIS OF THE AUDITORY APPARATUS; INTERNAL HYDROCEPHALUS; PERMANENT DRAINAGE OF THE LATERAL VENTRICLE. (The British Journal of Children's Diseases, June, 1915, p. 171.)

A girl, aged two and one-half years, was admitted to the hospital with a history of pain and discharge occurring from the left ear, left facial paralysis following one week later. There was a continual discharge from this ear, and the lymphatic glands in both anterior triangles of the neck were enlarged. A few days after admission a radical mastoid operation was performed on the left side. The tympanic part of the facial nerve was found to be completely lost in a mass of soft granulations, and the whole of the region of the labyrinth was crumbling, the jugular bulb being exposed. Two months later a facio-hypoglossal anastomosis was carried out. This, however, had no effect on the paralysis. Three weeks following there was a sudden complete right hemiplegia, with general signs of a chronic meningitis, squint, retraction of the head, and unconsciousness. The features gradually passed away but the hemiplegia continued with only slow improvement. Three right-sided convulsions occurred in the next six weeks. A large temporal flap was finally turned down and the whole of the squama was removed on the left side. The left and right mastoid cavities had previously been curetted. When the dura mater was turned down the leptomeninges were found to be intensely edematous, and a large quantity of cerebrospinal fluid ran away. The brain bulged strongly through the opening. In the posterior part of the exposed area the cortex was of normal color, but anteriorly it was blue and there was clearly some kind of cyst. This was punctured, and was found to be an enormously dilated lateral ventricle. The fluid was allowed to run away slowly, the dura mater was replaced and the scalp wound was closed. The next day the child was quite normal. The bulging, however, continued and gradually became more tense, until two weeks later there was a recurrence of the convulsions. The scalp bulge was immediately pierced by a long needle armed with No. 3 twist silk, the needle being passed right across the bulge and brought out through the skin some 2 inches beyond the edge of the old incision. Both ends of the silk were buried. One such line passed from above and behind downward and forward, emerging in the parotid region; two others led upward into the parietal region. There was an immediate and remarkable passage of fluid along the threads, producing an obvious edema, which has gradually subsided. Since that date the child's general health has been excellent and she has regained some power in the right limbs. The bacteriology of the condition proved it to be caused by human tubercle bacilli. H. R. M.

RURÄH, JOHN: THE SOY BEAN AND CONDENSED MILK IN INFANT FEEDING. (American Journal of the Medical Sciences, October, 1915, p. 502.)

In this most interesting article the author first goes into the history of the soy bean, its introduction into this country, and its great potentialities as a food. For the purpose of making gruel for infant feeding a flour was prepared from the bean, the analysis of which showed the following results: Protein, 44.64 per cent.; fat, 19.43 per cent.; mineral matter, 4.20 per cent.; moisture, 5.26 per cent.; crude fiber, 2.35 per cent.; cane sugar, 9.34 per cent.; non-nitrogenous extract, 14.78 per cent. Each ounce contained 13 grams of protein and 120 calories in the ratio of protein, 1.40; fat, 0.60, and sugar, 0.30. After considerable experimentation the author found that the best method of combining soy bean and condensed milk was to make a gruel composed of one level tablespoon of soy bean flour, two level tablespoons of barley flour, a pinch of salt, and one quart of water. This should be boiled for at least twenty minutes. To this is added condensed milk (1 in 12; fat, 0.83; protein, 0.75; sugar, 4.41). This can be used, according to the age of the child, in quantities varying from 2 to 8 ounces at a feeding. The class of cases to which this mixture is to be advised may be outlined as follows: When fresh milk cannot be obtained, or when the milk supply is very questionable, or when the infant is found to be incapable of digesting cow's milk. It will also be found useful in certain cases of intestinal indigestion in infants who, under ordinary circumstances, can digest cow's milk, but who have had their intestinal functions temporarily deranged. It may also be of service in cases of chronic vomiting, and particularly useful as a food after summer diarrhea. Without the condensed milk the gruel may be used as a food in many diarrheal conditions, but as is the case with every other food, there are many instances in which it will not agree with the child. Five cases are appended, all of which were successfully treated by the above method. H. R. M.

GINSBURG, H., TUMPOWSKY, I., AND CARLSON, A. J.: THE ONSET OF HUNGER IN INFANTS AFTER FEEDING. A CONTRIBUTION TO THE PHYSIOLOGY OF THE STOMACH. (Journal of the American Medical Association, May 29, 1915, p. 1,822.)

The authors have gone on the theory that the subjective sensation of hunger is caused by a certain type of contraction of the fundal end of the empty stomach stimulating sensory nerves in the wall of the stomach. Since the contractions peculiar to the cardiac and fundal ends of the empty stomach are, in normal individuals at least, an objective index of hunger, the balloon method may be used to determine the time of onset of hunger in infants after previous feeding. The observations were accordingly made on thirty normal infants from twenty-four hours to four weeks old. All tracings were made when the infants were asleep or otherwise quiet. The following is the summary: The infant's stomach showed feeble tonus contractions of the fundal end one hour after nursing. As the stomach discharged its contents these tonus undulations gradually increased in frequency and intensity, until by the end of from two and a half to three hours these became transformed into vigorous hunger contractions. The time of onset of hunger contractions varied for each infant, the minimum being two hours and the maximum three hours. In the normal individual the presence of vigorous hunger contractions is probably a biologic evidence that the stomach is in proper condition to receive food. If this is the case, the stomach of a normal infant is ready to receive food from two to three hours after the previous nursing. H. R. M.

PRIESTLEY, JOHN: THE SEX DISTRIBUTION OF RICKETS. (The British Journal of Children's Diseases, June, 1915, p. 173.)

In taking his records, as a school medical inspector, the author limited his observations to the number of marked deformities, knock-knees, bow-legs, marked *caput quadratum,* etc.; in other words, the cases which struck the eye. The total average percentage of rickets throughout five years, of over 75,000 children, was found to be 2.04 per cent. in boys, and 1.13 per cent. in girls, or in a ratio of not quite 2:1. It seems probable, therefore, that rickets is more prevalent among boys than girls and must be included among those disease the incidence of which is influenced to a considerable degree by sex. H. R. M.

STEVENS, H. C.: MONGOLIAN IDIOCY AND SYPHILIS. (Journal of the American Medical Association, May 15, 1915, p. 1,636.)

The theories in regard to the etiology of Mongolian idiocy may be summarized as follows: (1) Mongolism is caused by maternal exhaustion, because the Mongolian children are usually the last of large families. (2) Mongolism is caused by pressure on the basal ganglia of the brain, in proof of which it is cited that (*a*) the anteroposterior diameter of the cranium is shorter than in normal children, (*b*) the occiput is usually flat, and (*c*) the weight of the medulla relative to the remainder of the brain is less than in normal brains. (3) Mongolism is caused by agenesia of the cortex cerebri, because (*a*) the cortex is thinner than in normal brains, and (*b*) the pyramidal cells are fewer in number and have fewer processes than do those of normal brains. (4) Mongolism is due to parental syphilis. Of this the author writes at length. Sutherland, in his monograph, reported 25 cases, 14 of which definitely had syphilis. He considered Mongolism a parasyphilitic condition; in other words, an arrested development of certain parts of the brain from disease in the germinal cell.

The author's conclusions from 20 Mongols are: (1) The Wassermann reaction on the blood serum was positive in 10 per cent. (2) The Wassermann reaction on the spinal fluid was positive in 25 per cent. (3) Pleocytosis was present in 20 per cent. (4) The globulin content was increased in 90 per cent. (5) The gold chloride reaction showed color changes of two or more degrees in 90 per cent. of the cases, thus paralleling the globulin content.

These results certainly point toward a definite relationship between the two conditions. H. R. M.

PARINSON, I. PORTER: NOTE ON SUPPURATIVE PAROTITIS FOLLOWING PNEUMONIA. (The British Journal of Children's Diseases, May, 1915, p. 141.)

A boy, aged three years, was admitted to the Queen's Hospital for Children on January 2, 1915. He had been ill for a week with fever and cough. He had always been a weakly child; he had whooping-cough at four months and pneumonia when one year old. He was the elder of a family of two. The family history was healthy.

On admission there were signs of resolving pneumonia in the upper lobe of the left lung with harsh bronchial breathing at the base of the chest on the right side. The temperature was 99.5°F., pulse 108, respiration 24, heart, abdomen and throat normal. On January 7th the temperature rose to 104°, without any fresh signs in the chest; but next morning there was a hard, firm and tender swelling in the right parotid region, and on the next day the overlying skin was red and edematous, but no fluctuation was felt. On the following day, January 10th, a deep incision below the lobe of the ear reached an abscess, and a small quantity of thick pus was removed. Films from this showed pneumococci and a few staphylococci. A tube was left in the wound, and the temperature, which had kept continuously about 103°F., fell to normal. Recovery was uneventful, and was practically complete, when the child developed measles on January 23d, and had to be removed to the infirmary. This case is worthy of record on account of the rarity of parotitis following pneumonia and due to the pneumococcus. Apparently the in-

fection travelled by the blood stream, as there was no morbid appearance in the mouth, and the child never coughed up sputum, so it is unlikely that the *materies morbi* travelled up the duct.
H. R. M.

BERNSTEIN, E. P.: GAUCHER SPLENOMEGALY DIAGNOSED BY SPLEEN PUNCTURE BEFORE OPERATION. (Journal of the American Medical Association, June 5, 1915, p. 1,907.)

The patient was a sister of a boy who had been successfully splenectomized two years previously for what was clinically diagnosed as Gaucher's disease and proved so after operation by histologic study of the spleen. Other than this family history there were no symptoms pointing to the diagnosis of Gaucher's splenomegaly, with the exception of a moderately enlarged spleen. She was referred to a hospital and a splenic puncture preceding the operation was suggested. A simple puncture with a good-sized needle accordingly was made, and sufficient spleen pulp and blood mixture was aspirated to render a good-sized drop in the needle. On examination the characteristic multinucleated endothelial cells were found in abundance and the diagnosis was established. Aspiration, therefore, has proved to be of final diagnostic importance and should be especially valuable in doubtful cases. H. R. M.

LEVY, JULIUS, M.D.: THE INFANT MORTALITY PROBLEM IN NEW JERSEY. (Journal of the Medical Society of New York, September, 1915, p. 424.)

The infant mortality rate in New Jersey is unusually high. One factor of great prominence is that certain manufacturing towns of comparatively small population have a much higher death rate among infants than largely populated cities. The prenatal conditions unfavorable to infant life are: Certain occupations, poor hygiene, alcoholism and syphilis.

The following is an appalling example of the ravages on infant life among lead workers: Of 112 pregnancies among 22 lead workers, 55 ended in abortion and 4 in still life, and 36 of the infants died before the age of one year, leaving at the end of one year 16 living children out of 112 pregnancies—50 per cent. abortion and 68 per cent. mortality of those born alive.

In one little town of a population of 8,000, whose women are employed in the silk industry, the deaths under one year in some years make up more than 50 per cent. of the total deaths of the city. Alcoholism and syphilis play an important rôle. In an analysis of over 705 fetal deaths, J. Whitridge Williams, of Johns Hopkins, found syphilis the cause in 26 per cent.

The remedies suggested are: (1) The careful regulation and supervision of all occupations in the dangerous trades. (2) The regulation of women's labor. This regulation should include an eight-hour day for women and guarding against prolonged standing and such supervision as would compel a woman to remain away from the factory for six weeks before a confinement, and at least two months afterward, a procedure prevalent in eleven countries of Europe to-day. (3) Elimination of syphilis. (4) The general education of women in personal hygiene during pregnancy, after parturition and during the nursing period. This can best be done by the visiting nurses, infant consultation stations, and by the out-patient departments of dispensaries, whose facilities should be greatly increased for the examination of, and advice to, the pregnant woman.

The importance of maternal nursing must be fully brought home. One excellent suggestion the writer makes is that every girl from twelve years up should receive proper instruction in the hygiene and management of babies. A class for that purpose can be organized in each school. If we can impress mothers with the importance of maternal nursing, artificial feeding should play a very little part as a cause of infant mortality. When such feeding is indicated, simple dilutions of whole milk under the direction of the physician at the infant milk station and visiting nurse can easily be carried out. Occasionally one may need more intricate methods. Poverty, poor housing, insufficient ventilation, too little air space, and underfeeding of the mother are great economic factors which should come directly under the control of the State and the community.

Infant asylums are known to have an extremely high death rate. These should be eliminated entirely. The State must take care of the mother and infant by the establishment of homes for the destitute. Where possible, an infant can be boarded out with a private family. The special diseases of childhood which are responsible for infant mortality are: contagious diseases, pulmonary diseases, gastrointestinal diseases, congenital debility, malformations and diseases of early infancy. A great many deaths from the above causes can be prevented by the measures suggested. The problem is chiefly social, economic and educational. M. F.

BAGINSKY, ADOLF: THERAPY OF PNEUMONIA IN CHILDREN. (Archiv. für Kinderhk., April, 1915, pp. 190-203.)

In a paper which was meant for the "Festschrift" of Ganghofer, the writer states that the object of the paper is not so much to impress the younger men with the desire for therapeutic nihilism in this disease as to recommend the disuse of measures which not only have no beneficial effect, but much the contrary. The author cites a number of cases of pneumonia which recovered even when complicated by other ailments without the use of any drug whatever. He believes that *Vis medicatrix naturae* (when the patient is assisted by proper diet and hygiene) can of itself take care of pneumonia. "And yet how much digitalis, antipyrin, asperin, expectorants, as ipecac and apomorphin, camphor and benzoin, etc., are given in the critical moment of high fever and frequent pulse with the idea of helping; but thus misled, for every needless and superfluous medicament given to the patient causes considerable harm."

"May our younger physicians learn—what the older physicians have taken to heart—that the child has considerable resistance to pathologic results, infections and intoxications, and that this resistance responds to slight therapeutic assistance. Therefore it is necessary to call upon the severer means and methods when the most urgent indications are present."

M. S. R.

BAGINSKY, ADOLF: THE MOST IMPORTANT DIGESTIVE DISTURBANCES OF CHILDREN AND THEIR TREATMENT. (Archiv. für Kinderhk., April, 1915, pp. 161-190.)

In a very comprehensive article the writer takes up the physiology of digestion and the following diseases: habitual vomiting, nervous anorexia, atony of the stomach, achylia gastrica (achylous diarrhea), intestinal infantilism and obstipation.

Habitual vomiting occurs in hysterical, neurasthenic and psychoasthenic children. The parents of such children are often of nervous temperament, the vomiting usually occurs in the morning before going to school, and is not dependent on the food taken; children often show other nervous manifestations, as restlessness in sleep, insomnia, arrythmic pulse, palpitation, neuralgias and urinary disturbances; the children are usually pale and pasty looking. This form of vomiting resembles cyclic vomiting, but differs from the latter by the absence of acetone bodies in the urine. Children of this type often manifest peculiar tastes for salty and highly-seasoned food, for chalk, vinegar, coffee beans, sand, ashes, and at times complete anorexia for all food; the anorexia may be extreme and may lead to emaciation and death. In achylia gastrica there is a great diminution of HCl secretion and a great reduction in the production of pepsin and labferment; there is incomplete digestion of the stomach contents, and the motility of the stomach is diminished; one of the important sequelæ of this disease is diarrhea. Children with this disease are pale, the whole nutrition is below par, the musculature atonic. The stomach is distended, but atonic; peristalsis of intestines is easily observed, tongue is coated and breath foul. Fever only occasionally present. Colic from time to time. The stools usually loose, at times solid; appetite not disturbed. The heart, lungs and kidneys are normal. M. S. R.

BENJAMIN, M.: EXPERIENCES WITH TRICALCOL-CASEIN MILK. (Archiv. für Kinderhk., April, 1915, pp. 204-234.)

Tricalcol has been proved to be of value in rickets, when given alone and in combination with phosphor-cod-liver oil preparations. Good results have also been obtained in spasmophilia, exudative diathesis and eczema. Weih was the first to report its value in nutritional disturbances; he observed good results in dyspepsia; in decomposition the results were not so good.

Tricalcol casein is a white powder which does not change the taste of milk. It is prepared in the following manner: 20 g. of the powder is mixed with a small part of ½ liter of milk; then under continuous stirring the remainder of the ½ liter of milk is added; then ½ liter of boiled water with additional carbohydrate in form of Nahrzucker is added. The composition of 1 liter tricalcol-casein milk is: Fat, 25 g.; sugar, 15 g.; proteid, 30 g.; P_2O_5, 1.35 g.; CaO, 1.44 g.

Twenty-nine cases were tried with this milk, of which 1 case was one of balance disturbance, 17 dyspepsia, 8 decomposition, and 3 intoxication. Of these, 22 recovered and 7 died (1 of dyspepsia, 4 of decomposition, 2 of intoxication). The patient first receives a laxative; this is followed by a fasting of from six to twenty-four hours; you begin with 200-300 g. of this milk per day; the food is increased within twenty-four to forty-eight hours up to the necessary caloric requirements (erhaltungskost); then the food is more gradually increased until the infant receives from 150 to 180 g. per kilo. As additional carbohydrate Soxhlet's Nahrzucker is added (up to 3 per cent.); as second carbohydrate he adds "Seefeldner's Nährgriess." The food is taken readily by all children; no vomiting is ever observed on this food. Even in the severest cases the stools became dry and soapy and few in number (reaction alkaline). This milk is not suited as a permanent food, but should be looked upon only as a therapeutic measure. The increase in weight on this milk is not as frequently observed as on eiweissmilch. M. S. R.

Finizio, L.: Treatment of Dyspepsia in Infancy with Sugar. (Riv. di Clin. Pediat., October, 1914.)

Fifteen infants affected with dyspepsia and vomiting were treated as follows: After each feeding 2 ounces of 10 per cent. solution of cane sugar in water were given, so that the quantity of sugar taken in twenty-four hours ranged between ʒvii and ℥iii, the proportion being from 5 to 6 grams to each kilogram of body weight. The treatment lasted from seven to twenty-one days. Eleven out of the fifteen improved rapidly in from one to six days, vomiting ceased and stools became normal, while the weight increased. The 4 remaining babies were either very delicate or else diseased independently of the stomach trouble. These 15 cases were all breast-fed. In 16 bottle-fed babies improvement was seen in 12. The amount of sugar given daily ranged between ʒvii and ʒxxii; that is, from 4 to 20 grams to each kilo. The size of the children increased noticeably. There were no cases of elevation of temperature. Finizio refrains from drawing any conclusions from his investigations, merely giving the facts. C. D. M.

Crotalin. (C. R. Academie Sciences, 1914, Vol. CLVIII.)

Following the encouraging results obtained by Self, Spangler and Fackenheim come the experiments of Calmette and Mézie, who have been treating cases of epilepsy, particularly in children, with hypodermic doses of snake poison. The poison employed was a sterilized solution obtained from the Crotalus Adamanteus. The doses varied between 0.3 mg. and 15 mg. The results were very encouraging, as epileptic attacks ceased, especially in the youngest and most robust patients. When the crotalin had been treated with heat its efficacy appeared entirely destroyed.

C. D. M.

PERUSSIA, FELICE: ON RADIOGRAPHING THE UNBORN FETUS. (La Radiologia Medica, May, 1914, No. 5.)

Radiographs of the fetus in utero are admittedly of great diagnostic value, but very difficult to obtain. Perussia, having at his disposal the facilities offered by the Obstetrical Institute of Milan, gives precise directions for obtaining satisfactory results. The direction in which the picture is taken differs according to the particular diagnostic point involved. Thus the position of the fetus, the size of the head compared to that of the pelvis, the shape of the pelvic outlet, are all more easily appreciated in lateral views. When a clear view of the fetus alone is required, an oblique semi-lateral is to be preferred. Diaphragms and compression devices are indispensable, while intensifying screens help to give contrasty pictures. The vacuum tubes employed should be medium if not actually very soft. Exposures should be, if not instantaneous, at least very short. The patient should hold her breath during the exposure. C. D. M.

ALLPORT, FRANK, AND ROCHESTER, ALEX. S.: HAMMOND'S MASTOID SKIN GRAFTING. (Annals of Otology, Rhinology and Laryngology, June, 1915, p. 335.)

Some of the objections to the radical mastoid operation are tedious healing, painful dressings, incomplete bone covering, deposits of scabs and crusts, non-closure of Eustachian tube and loss of hearing. To overcome these bad after results, skin grafting has been used by many and in a number of ways. Hammond's method consists in spreading a large thin graft about two inches square on the site from which it has just been cut and laying over it a square of "crepe de lise" (a thin, silky material); this crepe and skin are then removed together, thus preventing the skin from curling on itself. These two layers are now rolled on a cone of gauze with the skin out and this cone is introduced into the meatus. The gauze is allowed to remain undisturbed for three or four days and then gently removed. The crepe de lise comes with it, but the skin never, because it has become attached to the underlying denuded surface. This method has been applied to 6 cases in children, with the results that healing took place in from four to ten weeks, except in 1 case, where there was lack of parental coöperation. S. W. T.

KAHN, HARRY, AND GORDON, L. E.: THE USE OF PITUITARY EXTRACT AS A COAGULANT IN SURGERY OF THE NOSE AND THROAT. (Annals of Otology, Rhinology and Laryngology, June, 1915, p. 322.)

In a table of 50 adenoid and tonsil operations performed on children from five to sixteen years of age, the author gives the results of the hypodermatic use of from 12 to 15 minims of pituitary extract given not less than fifteen minutes before the operation. The coagulant time was taken before and after the administration of this drug, and his conclusions show that this time is materially reduced; the subsequent hemorrhage is also much reduced. The effect on blood pressure is variable, but the pulse pressure is generally increased. It seems that in this drug we have a valuable aid in the reduction of hemorrhage and that is its chief value. S. W. T.

FORCORT, M. K.: PYLORIC STENOSIS IN INFANTS. (Archiv. für Kinderhk., April, 1915, pp. 234-268.)

This article presents an extensive review of the literature and a report of 15 original cases. In 11 of these cases the family history was negative. His cases do not corroborate the experience of others: that these cases are more frequent in nervous families. Nine of the cases were first-born, birth was normal in 11 cases; birth weight in 8 was above normal and in 1 below normal, in 6 it was not ascertained. Only 4 of his cases were exclusively breast-fed, 1 mixed-fed, and 10 were exclusively on the bottle. In 8 cases the first symptom appeared within two weeks after birth, in 2 in the third week, 1 in the fourth week, 2 in the fifth week, and 2 in the seventh week. "This relatively late onset of symptoms shows that probably that this stenosis is not congenital." (?) In most cases there is obstinate obstipation, in 2 cases there were loose stools. Thirteen of his patients were females. In 6 infants the gastric acidity was determined; the results varied in the same case from time to time, for which no conclusion could be drawn. [This was probably due to the fact that the stomach contents was not removed at the same intervals after the meal had been given.—M. S. R.] In 7 cases stomach contents was tried for free HCl and it was found only in 1 case. In 3 cases cocain was tried without result; anesthesia caused relaxation and somnolence, but had no influence on the vomiting. Vichy water slightly allayed the vomiting. Gastric lavage was without any effect on the course of the disease. Rectal alimentation was of some value. In all cases cataplasms were applied; they seemed to relieve pain and restlessness. Gastric massage, with the idea of helping passage of food through the obstructed pylorus, was of value in 3 cases. (???) In 1 case there was immediate gain in weight after this procedure was initiated. The best food is breast milk plus buttermilk or breast milk and malt soup. Eiweissmilch is distinctly injurious. Twelve cases recovered and 3 died. M. S. R.

BLOOM, CHAS, J.: INFECTIOUS DIARRHEA. (The New Orleans Medical and Surgical Journal, October, 1915, pp. 229-262.)

In an excellent article of 23 pages, Bloom records the result of work done at the Boston Floating Hospital by other investigators, summarizes their method, cites various authorities and adds 25 case histories in detail with comments on the results obtained. He believes the acute form of summer diarrhea is favored by congestion of tenements, lack of nutrition and unhygienic surroundings, plus a diminished resistance induced by high summer temperature. The Boston workers show conclusively that the blood pus and mucus of these dysenteries is not pathognomonic of any specific organism. A few of these cases at autopsy showed no evident lesions of the intestinal tract. There was a general conformity of type in the intestinal flora which was proteolytic in character.

For convenience of study the infectious diarrheas were divided into three groups: (1) Caused by bacillus dysenterii Flexner; (2) bacillus Welchi; (3) bacillus paratyphoid; (4) bacillus typhoid; (5) streptococci. Every other day a total white count and differential was made. In the 25 cases submitted by the author, 62½ per cent. of those under one year died. The total white cell count of those over one year averaged from 600-1,000 higher than the infants.

Of those fed exclusively on the breast previous to admission, it is interesting to note that with them the mortality was higher, in fact 80 per cent. died. Vomiting was a constant feature and, as a rule, not projectile in type; it was present in 21 of the 25 cases. Regarding the stools, it might be well to note that before entrance to the hospital the maximum number of stools was 25 and after admission only 10. The average number after admission was 4 in twenty-four hours. Those with the most frequent stools at the onset responded better to treatment and recovered in a majority of cases. In regard to the weight, the maximum loss in one twenty-four-hour period was 23 ounces, and in forty-eight hours 38 ounces. Each patient averaged ten days of fever while in the hospital. The pulse varied from 120 to 190. Those of 160 or over had, as a rule, an unfavorable outcome.

The toxic cases were, as a rule, the bacillus Flexner type, and the most toxic cases were bacillus Welchi and mixed infection. Reviewing the fact that the breast-fed died in greater proportion than those who had been dieted otherwise, the author assumes that the type caused by the bacillus Flexner were analogous to the contagious enteric fever. S. M.

ARNOLD, J. O.: BIRTH MORTALITY, WITH THE PRESENTATION OF SOME PRACTICAL HELPS IN THE PREVENTION AND TREATMENT OF ASPHYXIA NEONATORUM. (American Medicine, September, 1915.)

The author states that 100,000 infants die every year in the United States during the process of birth. He quotes Mall, of Johns Hopkins, who estimates that the number of still-births is at least one-half the total number of live births. He believes the two most important problems in the conduct of labor are: (1) Intrapartum study of the condition of the child; (2) the successful resuscitation of the newborn. He urges the more careful observation of the intrauterine heart sounds; the physician should be able to recognize changes in the quality and rate; this is peculiarly important when drugs have been used in connection with the labor.

He has constructed a monaural stethoscope of metal which can be readily sterilized; it is in one piece, cone shape and somewhat similar to the one-piece German wooden model. He strongly urges the abolishment of the time-honored methods of resuscitation, as violent slapping and exposure to alternate hot and cold water; these, he thinks, do more harm than good. He presents a mucus aspirator for the obstetric kit, which evidently is more serviceable than the routine catheter, and an infant lung motor which is small, can be sterilized and occupies but small space in the bag. The author feels confident that these instruments, if generally used, will do much toward combating birth mortality.

S. M.

HOAG, WARD B.: MALT SOUP: ITS PRACTICAL PREPARATION AND ITS USEFULNESS. (American Medicine, September, 1915, pp. 671-675.)

After reviewing the history of the introduction of malt soup into routine feeding and criticising the early methods employed, he advocates its more general use throughout the entire period of infancy. He lays special emphasis on its use after diarrhea and gastrointestinal upsets, when the mucus has disappeared from the stools and they have lost their offensive odor. He believes that if a malt soup formula at this time is unsatisfactory the only alternative is breast milk—the formula being made of 1 per cent. fat milk, with the gradual addition of malt and prepared flours. If in spite of this mixture the stools are frequent, thin and acid, alkali in the shape of sodium bicarb. or lime water.

S. M.

BOOK REVIEWS

DISEASES OF BONES AND JOINTS. By LEONARD W. ELY, M.D., Associate Professor of Surgery, Leland Stanford Junior University, San Francisco, Cal. New York, U. S. A.: Surgery Publishing Company, 92 William Street. 1914.

This book will come as a relief to that long-suffering individual, the "busy practitioner," in that it is short and concise and is not burdened with a mass of, to him, unnecessary detail. Rather does the author lay down broad general principles and point out how they may be applied. These principles are all based, as they should be, on the pathology of the condition, and numerous illustrations aptly aid him to this end. The nine chapters include: The Anatomy, Physiology and Pathology of Bones and Joints; Acute Arthritis, Chronic Arthritis, Type I.; Tuberculosis, Syphilis, Gonorrhea; other cases under Type I.; Chronic Arthritis, Type II.; Ankylosis, Diseases of the Shafts, Acute Osteomyelitis; Chronic Inflammations in the Bone Shafts, New Growths in Bones. The author's bibliography is extensive and the book denotes considerable thought. It is well bound and is printed in easily-read type.

THE BABY'S FIRST TWO YEARS. By RICHARD M. SMITH, M.D., Assistant in Pediatrics, Harvard Medical School; Assistant Visiting Physician, Children's Medical Department, Massachusetts General Hospital, Boston. With illustrations. Price, 75 cents net. Boston and New York: Houghton Mifflin Company. Cambridge: The Riverside Press. 1915.

This little book should be well received for two reasons: First, and to a degree less important, its proceeds are devoted to the "Milk and Baby Hygiene Association" of Boston; and, second, it is decidedly worth while from a medical and practical standpoint. It is so literally filled up with "plums" of thought that it is hard to put one's finger on any one thing which stands out above its fellows. However, chapter eight, entitled "A Typical Day," is unique in its way, and gives a complete, if rather formidable array of things which happen, or, rather, should happen, their time, and the apparatus used. One hopes that the mother, if she takes care of her baby herself, will not decide upon future race suicide, to avoid performing from 5 A.M. to 9 P.M. through 25 pages of closely written instructions. The chapters include the following: Preparations for the Baby; Normal Development; The Care of the Baby's Body; Breast Feeding; Bottle Feeding; Diet to Two Years; Stools; Habits and Training; Clothes; Sickness; The New Mother; How to Travel with a Baby (in the first place, don't!); A Typical Day; and Recipes and Charts. There are nine illustrations. The reviewer could find but one criticism of this valuable book. He was sorry to find he had reached the end and instead of the "Baby's First Two Years of Life" it was not its first six, or even more. Mothers as well as doctors can read it to advantage. Needless to say, it is well written, printed and bound.

ARCHIVES OF PEDIATRICS

DECEMBER, 1915

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ORIGINAL COMMUNICATIONS

FOREIGN BODY PNEUMONIAS *

BY A. CAILLÉ, M.D.
New York City

In 1914, during my four months' service at the New York Post-Graduate Hospital, I had an opportunity of observing the behavior of foreign bodies in the deep respiratory tract in 3 cases, the clinical features of which are of sufficient interest to warrant a brief report.

Two of the cases were sent to the wards with an outside diagnosis of "unresolved pneumonia," and without the suspicion of a foreign body in the lungs. The third case came with a foreign body history.

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* Presented at the Annual Meeting of the American Pediatric Society, held May 25, 1915, at Lakewood, N. J.

Case 1. Morris V., two years and ten months old, became sick four weeks previous to admission with chills, fever, vomiting, cough and dyspnea. These symptoms were observed and charted during the first few days of the child's stay in the hospital, also it was observed that pus was occasionally coughed up. The temperature chart showed fever up to 104°F., with daily remissions to normal. The routine clinical examination, which included von Pirquet and Wassermann tests, was negative except as follows:—

The blood examination showed moderate leukocytosis and a moderate increase of polynuclears. There was dullness on percussion over the entire right lung posteriorly and in the right axilla. Dullness was most marked at the base. Breathing sounds and voice were indistinct at base. Needle aspiration in dull area was negative as to fluid.

The spasmodic character of the cough, the expectoration of pus in an acute lesion, in the absence of amphoric breathing such as we find in cavity formation, gave rise to the suspicion of a *foreign body irritation.* The Roentgenogram, of which I show you the print (Fig. 1), reveals a large tack, with a large round head, in the right lung. Our bronchoscopist, Dr. Forbes, tried to remove the nail with the aid of the bronchoscope and a long, slender forceps on April 24th and failed at the first attempt. Four days later a second attempt, guided by the fluoroscope, was successful. Rapid improvement followed the removal of the tack; the physical signs cleared up, and the child was discharged cured. The tack had been lodged in the lung about five weeks.

Case 2. Eva B., age two years, was admitted April 1, 1914, with the following history:—

Pneumonia one year ago. Diphtheria three months ago. There was no resolution following the attack of pneumonia, and the child's troublesome spasmodic cough persisted throughout the year. During the first few days of the child's admission the temperature ranged from normal to 103°F.

The routine clinical examination, which included the Wassermann test, was negative, excepting as follows:—

The von Pirquet reaction was slightly positive, the blood examination showed secondary anemia. Percussion over the left chest anteriorly gave an almost flat note, posteriorly there was dullness to flatness from apex to base. Over the right lung posteriorly the percussion note was impaired. On auscultation over the left lung anteriorly many coarse and subcrepitant râles were heard. Bronchial to tubular breath sounds were heard over the left chest posteriorly with numerous crepitant and coarse râles. Over anterior and posterior right chest a few coarse râles were heard. No pus was found on puncture. Without loss of time an X-ray examination was made. The Roentgenogram, of which I present a copy (Fig 2), shows a large nail in the left bronchus and partly in the trachea. The first attempt to remove the nail with a bronchoscope and forceps failed. After this operation breathing became noisy and croupy and in intervals considerable yellow, foul-smelling pus was coughed up, after which the temperature dropped to the normal.

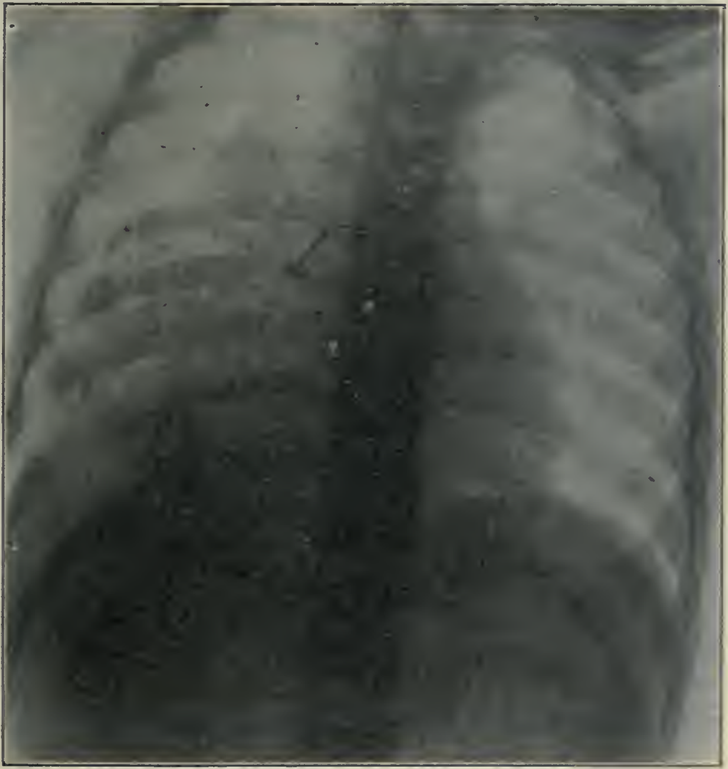

Fig. 1. Large tack in consolidated right lung.

On April 14th a lower tracheotomy was performed and Dr. Forbes succeeded in engaging and removing the nail with the aid of the bronchoscope. By the following day, April 16th, an extensive pneumonia had developed, with temperature up to 105°F., pulse 140, respiration 66, and the child died on April 17th. In all probability the nail had been in the child's lung for over a year.

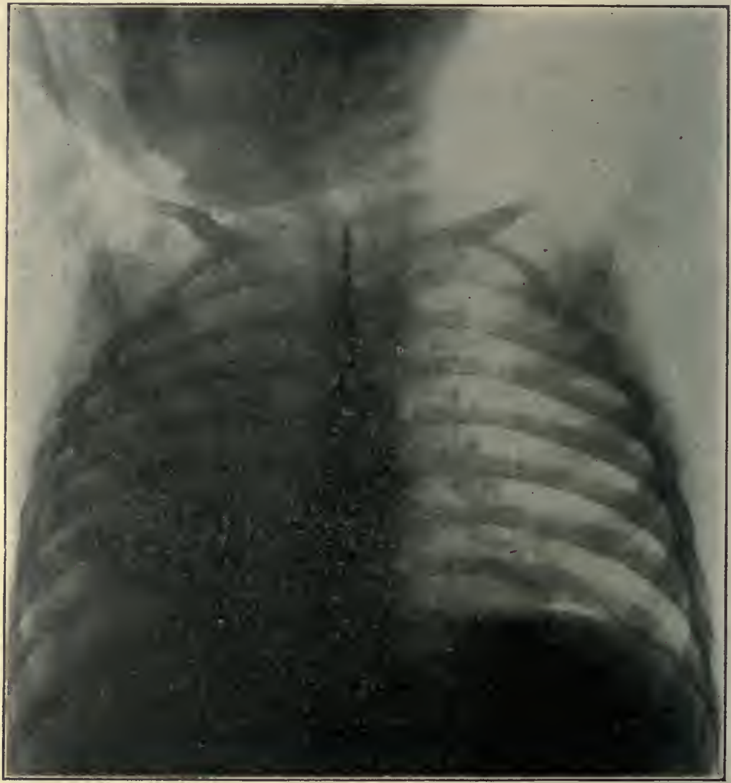

Fig. 2. Large nail in consolidated right lung and in bronchus.

CASE 3. John L., age four, admitted to the hospital April 6, 1914, and discharged May 15, 1914.

History as given by the mother: Three days before admission to the hospital child "swallowed" a shawl pin. During the night the child complained of pain in the chest, but otherwise was apparently comfortable. He ate regularly, and had normal bowel action; the stools had been watched, but the pin had not appeared.

On admission to the wards the boy was found to be well developed and well nourished. His tongue was clean and moist, heart and lungs were normal, no adventitious breath sounds, no cough, abdomen negative. Temperature, 99.4°.

An X-ray plate made the following day, of which I show you a print (Fig. 3), reveals the shawl pin in the left bronchus and lung, the point projecting at the bifurcation in the trachea.

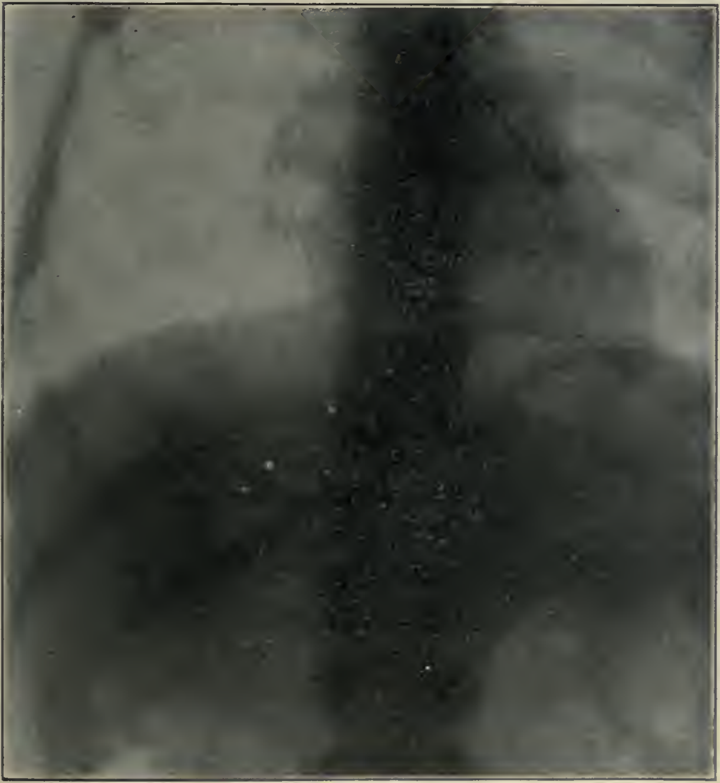

Fig. 4. Shawl pin in non-consolidated left lung.

An attempt was made to remove the foreign body with the aid of the bronchoscope by the upper route, but was unsuccessful. Following this procedure the temperature rose to 104°F., and for two weeks an irregular fever persisted. During the febrile period it was deemed wise not to subject the child to further manipulation with the bronchoscope.

On May 7th a second Roentgenogram was made, which gave the same picture as the first and showed no evidence of infiltration around the foreign body. On May 12th, one day previous to the date fixed upon for a second exploration with the bronchoscope, the child, during a severe spasmodic coughing spell, coughed up the 2½-inch long brass shawl pin.

The boy went home in perfect health. The pin had been in the child's lung forty-three days without inducing local inflammation.

Young children have a habit of putting things into the mouth, and not infrequently we encounter cases in which foreign bodies, such as whistles, coins, safety-pins and so forth, are retained in the gullet or in the upper respiratory tract.

Mothers and nurses in many instances have a habit of holding safety and stick-pins in the mouth, thus teaching this dangerous practice to their children by suggestion. As a rule, patients are brought to the physician with a foreign body history, and with well-known acute symptoms.

In 2 of the cases here presented neither the mother nor the family physician suspected a foreign body as the cause of the pneumonia. Had these cases not been transferred to institutional care, with its modern equipment, in all probability both would have perished with a verdict of death from pneumonia. Moreover, these cases show the great value of Roentgenograms in diagnosis and the value of bronchoscopic methods.

The following deductions seem warranted:—

(1) All cases of unresolved pneumonia and cases of pneumonia of atypical behavior should be X-rayed.

(2) All foreign body cases should be publicly reported in the lay press, as a warning to those having charge of young children to keep things out of reach and not to teach dangerous practices by direct suggestion.

DISSEMINATED MILIARY TUBERCULOSIS—GENERAL—X-RAY OF THE LUNGS AND ILLUSTRATIONS OF SKIN LESIONS *

BY W. P. NORTHRUP
New York City

In the Transactions of the Association of American Physicians, 1913, will be found 3 similar cases. The report is developed along these lines, viz.:—"Two helps to the diagnosis (tuberculosis)—one of the lungs—the X-ray; the other of the skin—the eruption." To those cases I now wish to add another. Skin tuberculosis in the very young is sufficiently rare to justify the addition of a single case. Tileston's conclusion that it occurs only in the fatal cases seems to be justified. In other words, it is a terminal event. It occurs when the vitality is seriously reduced.

A Polish child fifteen months old entered the Presbyterian Hospital January 11th of the present year and died in the following month, the 24th. The caption of its history tells the story in the shortest terms. Tuberculous meningitis, pulmonary tuberculosis, tuberculosis of the skin (not forgetting to add)—autopsy. There was a history of tuberculosis in the mother and a brother.

The baby, when born, is said to have weighed 9 pounds, to have been breast-fed for four months, to have had diarrhea two and a half months and otherwise to have been free of well-pronounced illnesses. Coughs and colds it did have.

Present illness began six months before entrance with wasting. It lost weight till, to quote the broken English expressions, "it was skin and bone." Further history is lost in conjecture and the mysteries of a foreign language. Cough—no vomiting—no crying is noted in the record.

Physical examination. A poorly nourished infant, poorly developed, with little of importance to add save nose discharging and enlarged glands; large gland near one ear, many submaxillary glands, some quite large, many post-cervical, one large in axilla, size of a marble, some small ones in each axilla, large inguinals, no epitrochlears, etc.

Skin eruption, papulo-pustular, umbilicated, over the trunk, most on the back, scanty on the front, a few on the face and on the dorsal surface of the forearm. Some interest attaches to pea-

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* Presented at the Annual Meeting of the American Pediatric Society, held May 25, 1915, at Lakewood, N. J.

sized nodules found in the subcutaneous tissue on the left forearm, one on the arm, one in each calf, symmetrically. One of these removed and examined proved to be tuberculous.

The present case is but an echo of the previous published cases. They were of interest mainly as to diagnosis. It was difficult to interpret confidently the physical signs of chest lesions and the X-ray helped to a diagnosis: the skin lesion was rare and obscure. In the present case the percussion was unchanged, there was no bronchial voice or breathing, no râles in front. At angle of the scapula there were increase of voice and whistling râles. In a feeble marantic infant these would not be conclusive signs. Here is the triumph of the X-ray picture. The child was pot-bellied, liver and spleen somewhat enlarged, otherwise there is little to record.

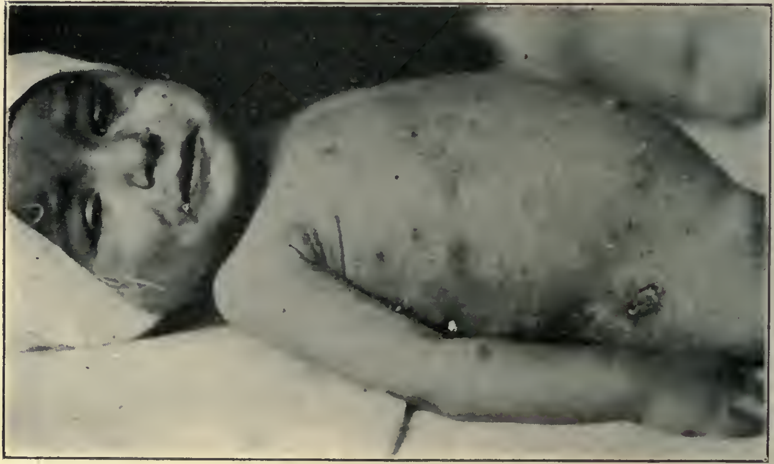


Fig. 1. Tuberculous eruption in general miliary tuberculosis.

Among the negative tests may be mentioned that no tubercle bacilli were found in the sputum, in the feces (one doubtful one is mentioned), and what is more of interest none were found in the skin eruption. They were abundant in former cases.

Skin lesion—microscopic examination (quoting the record):

"Perfectly distinct ulcerated area at one point extending into the tela subcutanea. Epidermis is gone, but there is a small overlying scab composed of fibrous tissue filled with wandering cells and a few polymorphonuclears. The ulcerated areas are composed of a loose reticulated connective tissue packed with cells. There are a mixture of wandering cells and polys and some little distance from the ulcer there is a distinct wandering cell infiltration similar to that seen in a section of a positive von Pirquet reaction, but much less extensive. A careful search for tubercle bacilli is fruitless."

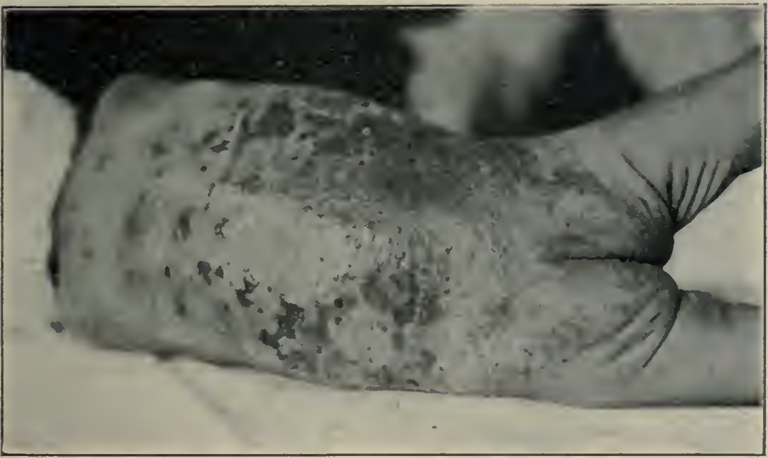
"It is impossible to say definitely what the lesion is in the absence of tubercle bacilli, but apparently it is a tuberculide of the skin with some secondary infection." (Dr. Lamb.)

Urine examination: practically normal.

Blood and spinal fluid: practically normal.

Lymph nodes: section showed greater part of node quite caseous. Typical giant cells.

Skin: In the tela subcutanea there is a large, perfectly defined tubercle showing central necrosis but no giant cells.



Tuberculous eruption—skin necrotic tuberculide. (Pfaundler and Schlossmann). Macerated skin in middle of back is covered with ointment.

Dr. Lamb has no hesitancy in pronouncing tubercle in the lymph nodes and in the subcutaneous tissue. The lungs showed widespread scattered miliary tubercles, tubercles in the bronchial glands.

Intestines: tuberculous ulcers and mesenteric glands. Colon: large transverse ulcers, large tuberculous masses in the meso-colon.

Tubercles in the meninges: edema.

Disseminated tuberculous eruption of the skin, necrotic tuberculid, is not common, that is in infants. Localized tuberculosis is common. Skin specialists have showed me disseminated tubercular lesions of the skin which have little obvious in common with the present. They said they did not expect to find tubercle bacilli in the lesion. My hospital experience leads me to think that the present lesion is rare. Again this case makes one rejoice that the X-ray has come into use and is so successful in infants. One might conjecture and search diligently for bacilli and at the end have no positive proof. The X-ray here serves its most useful purpose. Certainly the physical signs in the chest were not convincing.

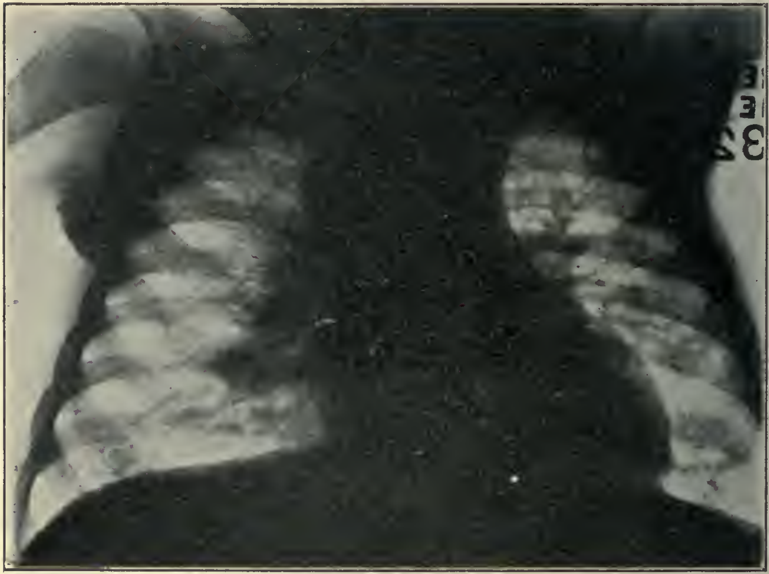


Fig. 3. Disseminated miliary tuberculosis of the lungs.

This is the fourth case observed at the Presbyterian Hospital. To the best of my memory no case has been recorded from the New York Foundling Hospital. It is sufficiently rare to warrant calling the attention to a single further case. I wish to point to a full description and record of cases by Tileston of Boston in the *Archives of Internal Medicine,* July, 1909, Volume IV., page 21. Our own cases may be found in the Transactions of the Association of American Physicians, 1913, under the caption of "Disseminated Miliary Tuberculosis of Lungs and Skin."

57 East Seventy-ninth Street.

THE VALUE OF THE X-RAY IN INTRATHORACIC LESIONS IN CHILDREN*

BY ROWLAND G. FREEMAN, M.D.
New York City

I have been much impressed in discussions on the X-ray by the difference of opinion as to the value of X-ray and by the considerable number of careful observers who seem to believe that the X-ray is of little value and causes mistakes in diagnosis. It is my belief that the men who have this opinion have never been able to make free use of a well-equipped X-ray laboratory presided over by an expert radiologist. Disappointment in the use of this means of diagnosis may result from expecting too much from it. Alone, it is generally of little value, but, like other evidence, in combination with clinical history and physical signs, it may be conclusive.

Auscultation, our most valuable means for determining the character of intrathoracic lesions, is of materially less value than auscultation in combination with percussion, and auscultation and percussion aided by a good X-ray plate may fix a diagnosis that might otherwise remain obscure, for the X-ray may show us lesions in the chest of which we can obtain no knowledge by any of our means of physical examination.

The results of radiography vary with the part that is to be radiographed. A good X-ray of bones is of course most readily obtained and gives most important results. X-rays of the abdomen in children are frequently disappointing, although occasionally they give important information. Radiographs of the chest, however, in children are a material aid in diagnosis.

The X-ray is probably of most value in making the diagnosis of miliary tuberculosis, often in determining a pneumonia of which we get no physical signs, in making a differential diagnosis between empyema and pneumonia, or in corroboration of a diagnosis of diaphragmatic hernia, while in lesions of the heart it furnishes reliable information as to enlargement, in the modification of the shape of the heart, in dilatation or the presence of exudate, and will often differentiate for us plastic exudate from fluid.

Concerning its use in the diagnosis of miliary tuberculosis there is probably more accord than concerning other conditions, for we all know that the physical signs of miliary tuberculosis in the lungs are those only of a slight bronchitis. We see repeatedly children with a temperature, sibilant and sonorous râles, sometimes subcrepitant, of the significance of which we can get no definite estimation without the X-ray. A von Pirquet test, if positive, will render the diagnosis of tuberculosis more probable, but still leaves us with the possibility of a simple bronchitis in a child with a tuberculous lymph node somewhere in the body. Having, however, obtained a characteristic picture by X-ray we no longer need to speculate on the lesion present.

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* Presented at the Annual Meeting of the American Pediatric Society, held May 25, 1915, at Lakewood, N. J.

The diagnosis of cases of pneumonia in children, although usually evident to an intelligent pediatrician, we have learned from the use of the X-ray, is occasionally impossible. Cases of well-defined pneumonia may give rise to no physical signs and even after the pneumonia has been localized by the X-ray a subsequent physical examination will give negative results.

Diagnosis of fluid in the chest may often be corroborated by an X-ray.

The presence of air in the chest is also well shown in the X-ray, and if there occurs a combination of air and pus one gets a pus level which is very characteristic.

The question often arises whether a murmur heard over the heart is a so-called hemic or anemic murmur or a murmur due to a damaged valve in the heart.

Many children are prevented from taking the exercise which they need and should have for their physical development and health by the presence of a cardiac murmur without other evidence of cardiac disease. In such cases an X-ray picture of the heart gives one an excellent basis for an opinion as to the origin of the murmur.

In diseases of the heart in children the X-ray gives us, I believe, a most valuable indication of the amount of damage to the heart by the size and shape of the heart shadow, and successive pictures provide us with one of our best means for the control of exercise in these cases. For such control, of course, the temperature and pulse rate are of great value, but the X-ray picture will occasionally change our method of treatment to the advantage of the patient.

Another condition shown well by the X-ray, of which we get little evidence otherwise, is enlargement of the thymus gland which gives a broad shadow above the heart. Enlargement of the bronchial and mediastinal lymph nodes may also be brought out by the X-ray.

In one other condition I have found the X-ray useful and that is in corroboration of a diagnosis of diaphragmatic hernia, and I can show you some excellent pictures of X-rays taken of a case of this sort.

In conclusion I would say that the X-ray furnishes a most important means in reaching a definite diagnosis of intrathoracic lesions. It should not be neglected in any obscure case. It is particularly adapted to children, as one can get a better picture of a child usually than of an adult, and because children, even when sick, can easily be carried to an X-ray laboratory.

The accompanying plates illustrate the points I have brought out. They are drawn from 3 cases.

The first case (Chart 1) is that of a child who came into our ward with a remitting temperature with almost no record of accelerated respirations, although on counting them on one occasion at the bedside I found them to be 40. Physical examination showed good breathing and percussion note and voice over both lungs, and we examined carefully the ears, urine, abdomen and other parts of the body for the cause of this temperature with negative results. The X-ray plate (Plate 1), however, showed us a well-defined pneumonia. After we had seen the X-ray plate we went back to the ward and re-examined the child carefully, knowing where the signs ought to be, but we could obtain no signs. A second X-ray plate (Plate 2), taken three days later, confirmed the first.

The second case (Plate 3) shows a very large heart. It is that of a boy who came into our service with a heart apex displaced downward and outward, a heart that percussed very large and a rapid pulse and dyspnea. He had a systolic and presystolic murmur at the apex as well as a systolic murmur over the mitral area at the base. Six weeks after admission he developed pericardial friction sounds followed by a diminution in audibility of the heart sounds, and the X-ray plate (Plate 4) showed an increased heart shadow due to this exudate. The boy then improved, and the plate made eight days later shows a much smaller heart shadow. (Plate 5.) Sixteen days later the boy's condition became very bad with marked edema of the legs and scrotum, with fluid in the left pleural cavity, and another X-ray plate (Plate 6) showed the presence of a moderate amount of fluid in the pericardium. Under digipuratum the edema rapidly disappeared and another X-ray plate (Plate 7), taken a week later, showed a diminution of about one-half of the amount of fluid in the pericardium, while a few days later an X-ray plate gave us accurate information that no more fluid existed in the pericardium. Subsequently, as the boy improved, the heart became smaller, and Plate 8 shows the heart shadow six months later, when the boy was up and about with fair compensation.

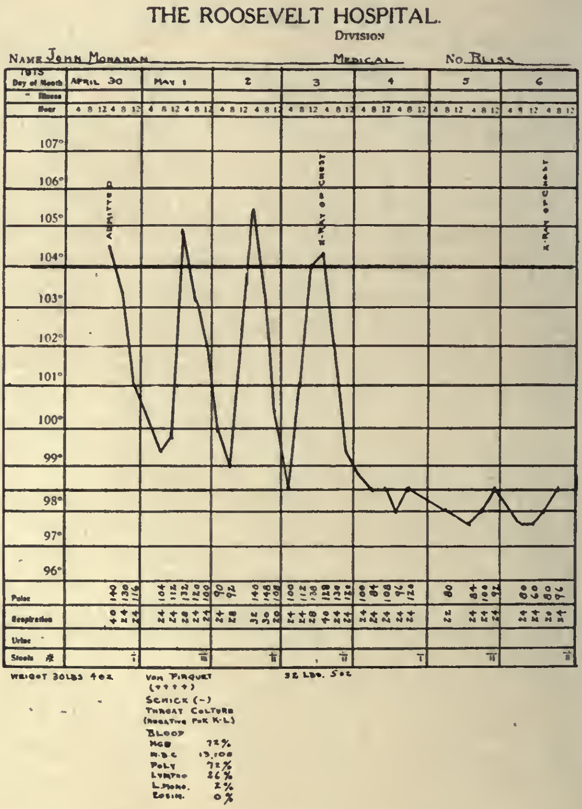

CHART 1—Chart of a case (Case 1) of pneumonia without physical signs but showing a shadow on the X-ray plate

Chart 2 is that of a child (Case 3) with a mitral lesion, who on X-ray (Plate 9) showed a large heart. She was kept in bed

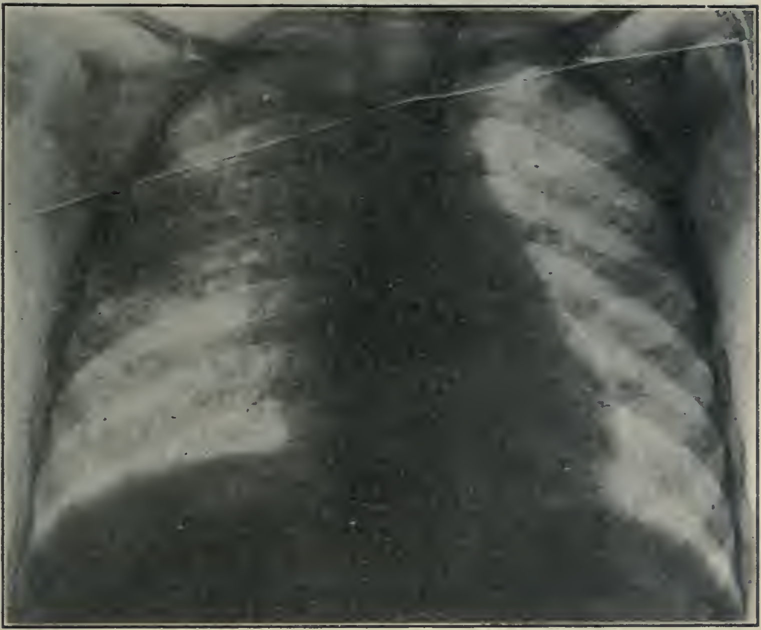

Plate 1. Radiograph of thorax of Case 1, showing well-defined pneumonia of the right middle lobe.

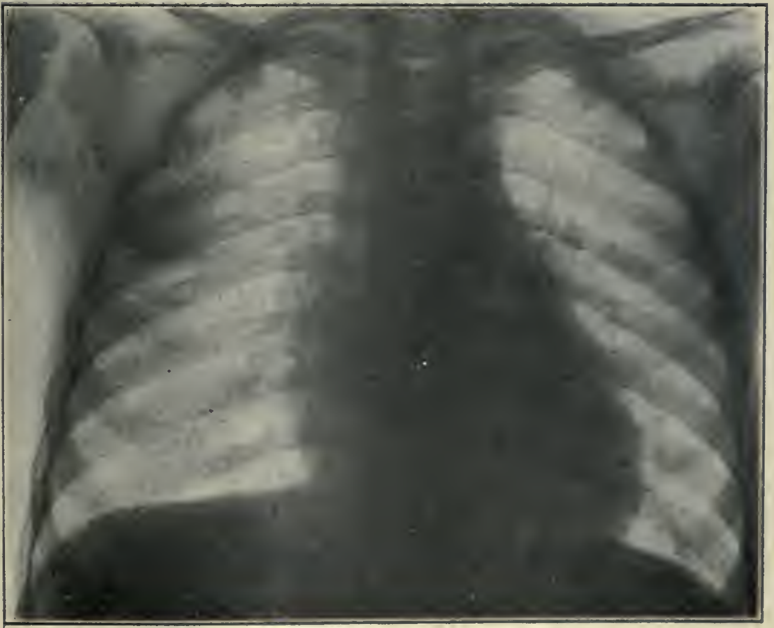

Plate 2. Radiograph of thorax of Case 1, three days after Plate 1.

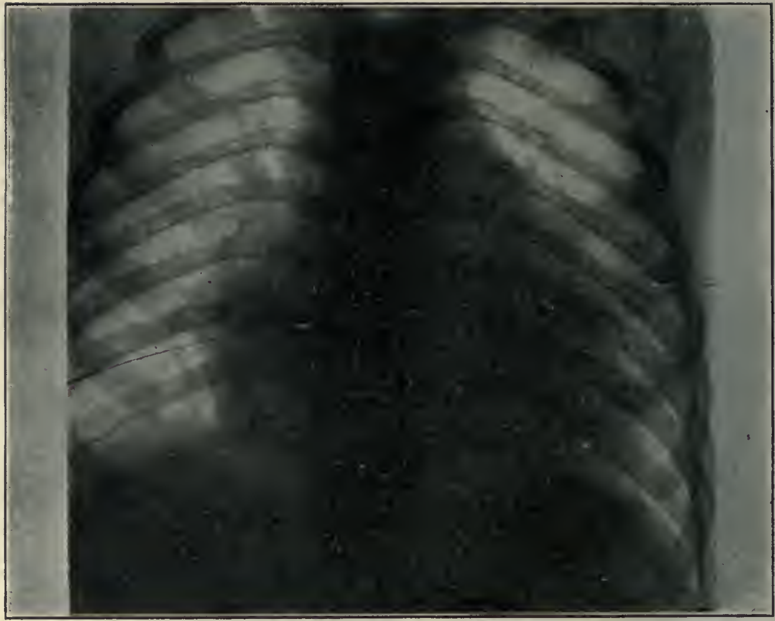

Plate 3. Radiograph of Case 2, showing heart shadow on admission.

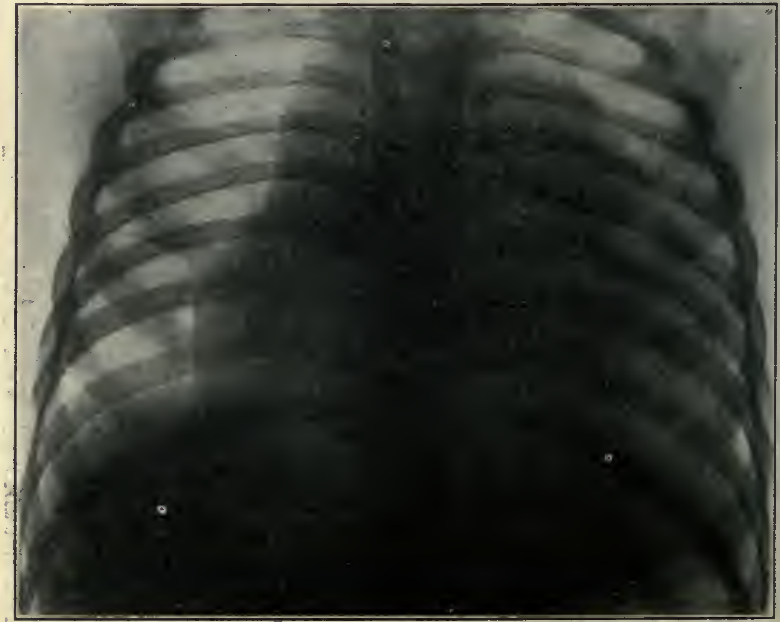

Plate 4. Radiograph of Case 2, showing enlarged heart shadow due to plastic exudate.

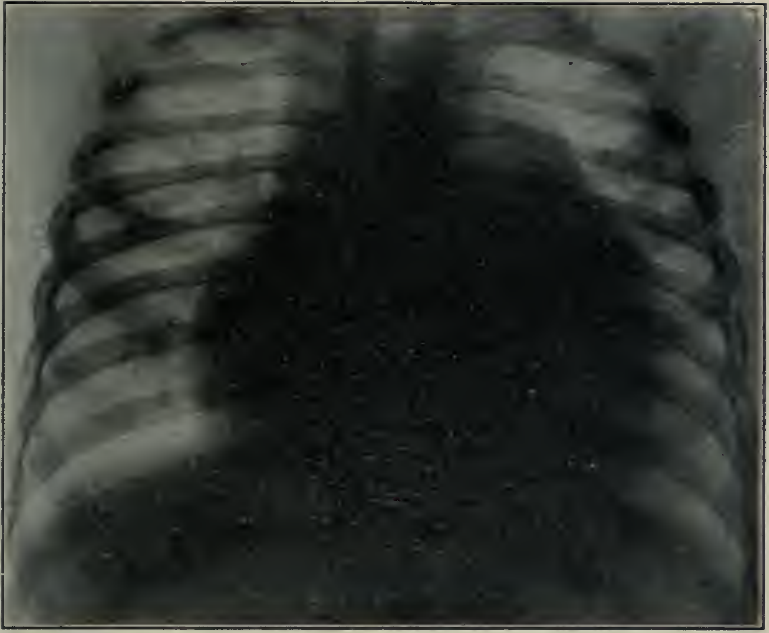

Plate 5. Radiograph of Case 2, eight days later than Plate 4, after improvement in general condition and physical signs.

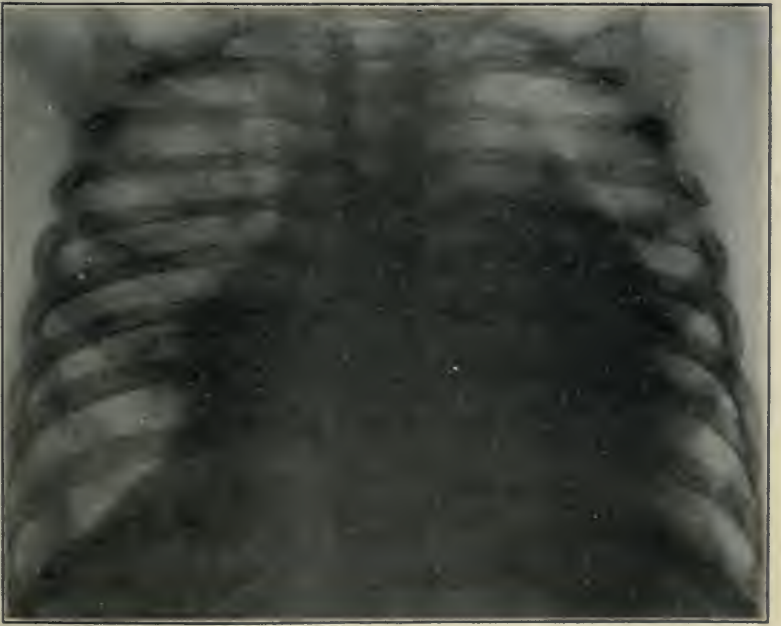

Plate 6. Radiograph of Case 2, showing presence of pericardial fluid by obliteration of the normal cardio-phrenic angle, at the junction of the shadow of the right border of the heart and the diaphragm.

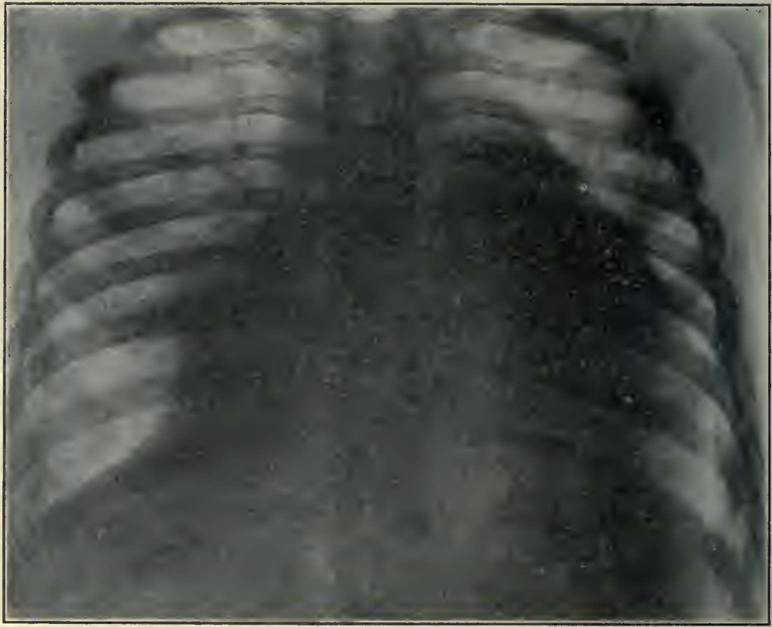

Plate 7. Radiograph of Case 2, one week later than Plate 6, with fluid reduced but still present.

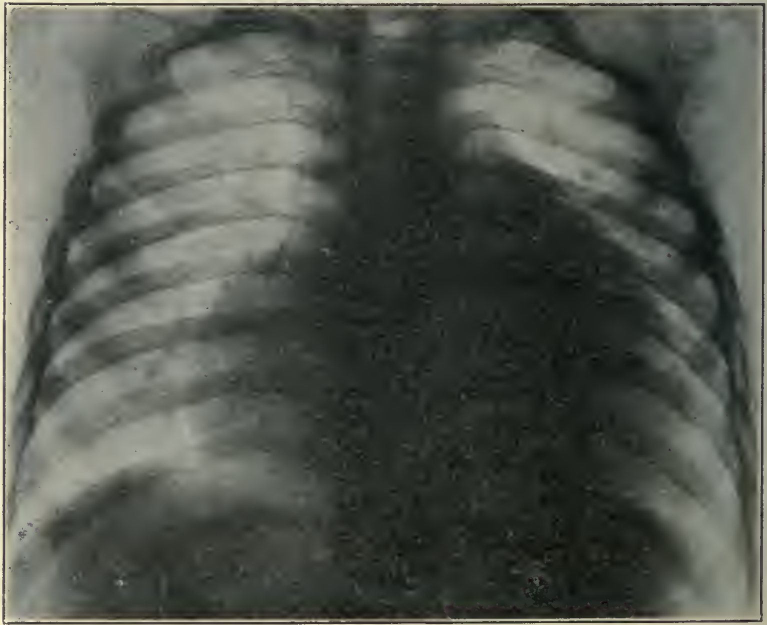

Plate 8. Radiograph of Case 2, six months later when the child was fairly well.

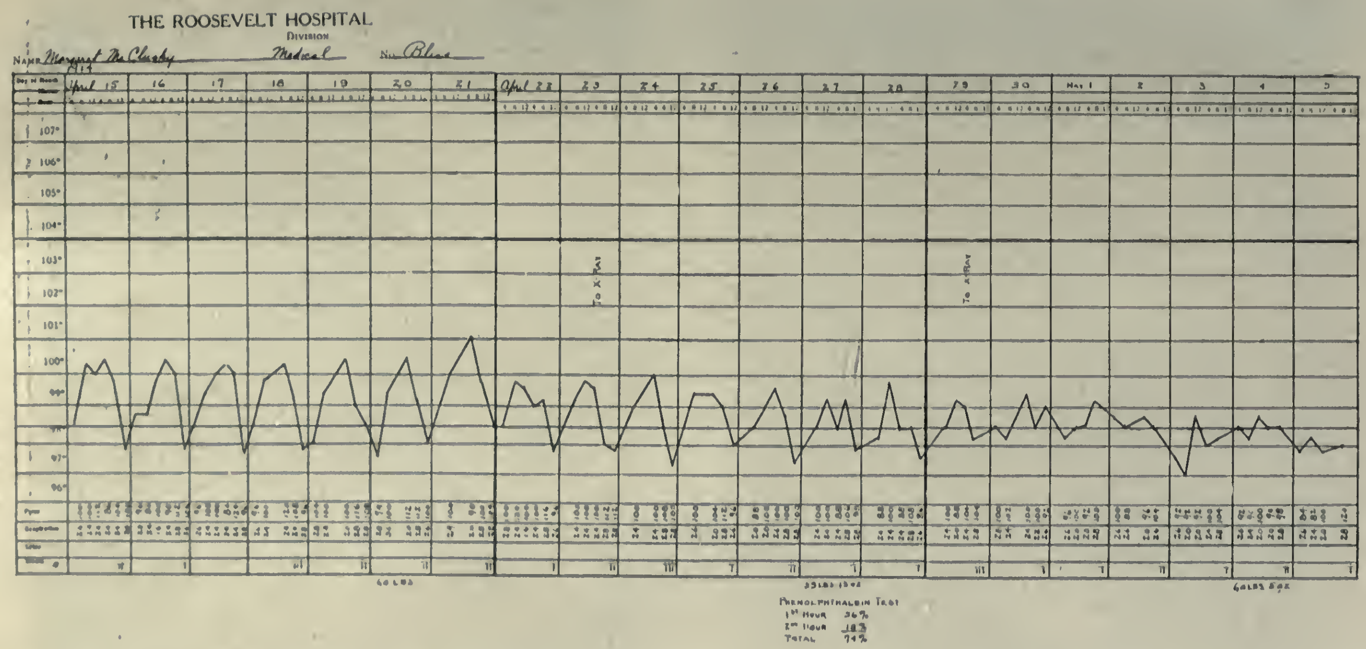

CHART 2—Chart of Case 3, showing the gradual reduction of temperature to normal after April 23d, when the second X-ray plate was made and the child was put to bed

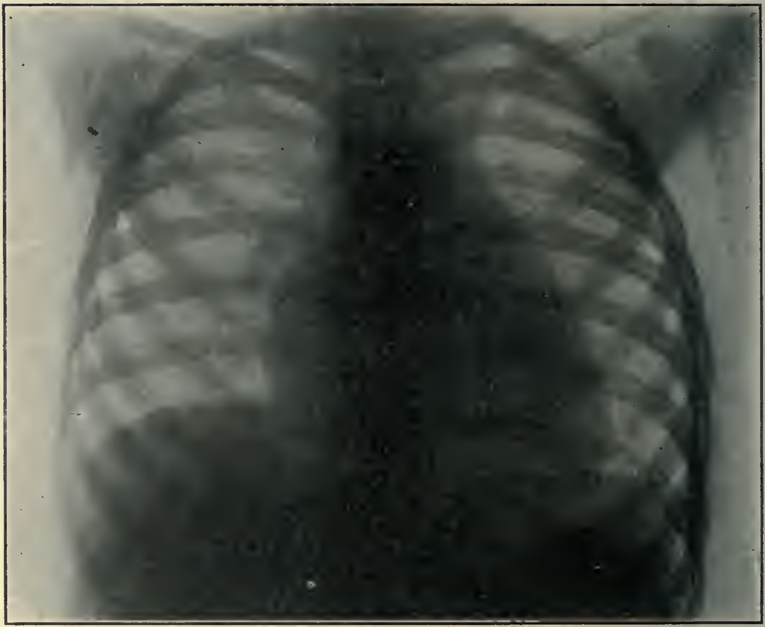

Plate 9. Radiograph of Case 3 on admission.

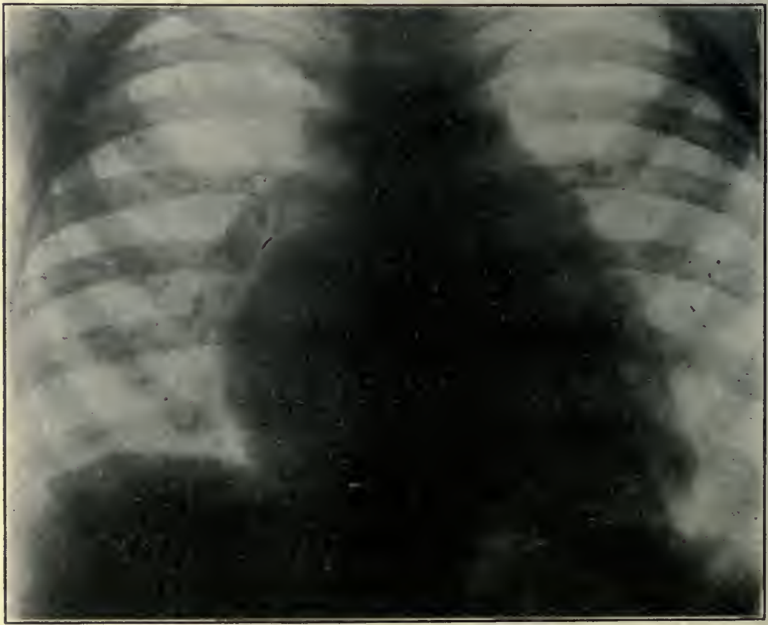

Plate 10. Radiograph of Case 3, twenty-four days later, after being allowed up.

for some days and then allowed up a part of the day, and then a whole day because her compensation was improving, she was gaining in weight and was looking better. She was, however running a little temperature, so that we had an X-ray photograph made twenty-four days after admission. This plate (Plate 10) showed the heart to be rather larger, a little fuller on the left side, and showed us also that we had been deceived in thinking that the child's heart was better because her general condition had improved. On this account she was put to bed. Her temperature then became normal and her heart shadow again improved. (Plate 11.)

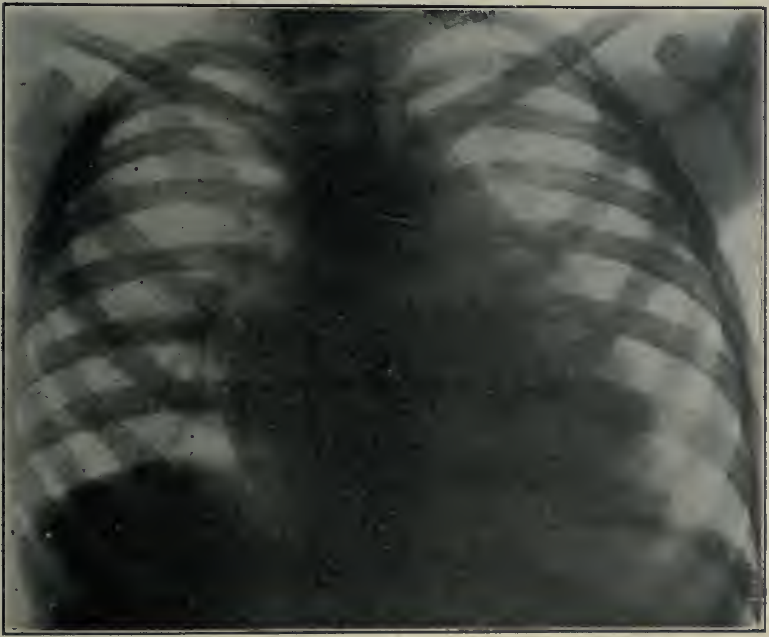

Plate 11. Radiograph of Case 3, after six days in bed.

Our X-ray plate in this case gave us information that we had been unable to obtain by other clinical measures, and led us to a correct method of treating the child. The X-ray, therefore, not only is an aid in diagnosis, but may furnish indications for treatment.

211 West Fifty-seventh Street.

A CASE OF AMAUROTIC FAMILY IDIOCY IN ONE OF TWINS*

BY CHARLES HERRMAN, M.D.

New York City

J. R., first seen on December 12, 1914, at the age of twenty months. The parents are Hebrews and distantly related. The mother has had kidney and uterine trouble; the father is healthy; one of his brothers is paralyzed. As far as is known no other member of the family has had any mental or nervous disease. The mother is married nineteen years and has been pregnant seven times. First, a miscarriage three months after marriage; second, a boy, now seventeen years of age, attending high school; he had convulsions twice as an infant; third, a girl now fourteen years old, who is in the graduating class at school; the fourth child, which died at the age of one year from pneumonia and convulsions, had been sick for four months; the fifth died suddenly with convulsions; the sixth was a stillbirth; the seventh pregnancy resulted in the twins, of which the patient is one. During the last pregnancy the mother had headache, edema and ascites. The labor was normal; the babies weighed 5 pounds each at birth; they were breast-fed for only two weeks. Both infants developed normally during the first five months; they smiled, held up the head, and grasped objects. After that time the patient paid less attention to his surroundings, was less active, and at eight months he was not able to hold up his head properly, whereas his twin sister could sit up alone. The first teeth appeared at fourteen months (twin twelve months). It was later noticed that the patient no longer grasped or followed objects. Recently he has had convulsions. The patient was admitted to the Lebanon Hospital on December 13, 1914. Examination shows a pale but fairly well nourished infant weighing 18½ pounds (Figs. 1 and 2), apathetic and pays no attention to his surroundings. Cannot sit up or hold up the head properly; does not grasp or follow objects; face expressionless; occasionally a peculiar laugh; starts suddenly at loud noises. Circumference of the head 19¼ inches (18½=normal); four teeth. Examination of the eyes (Dr. Heller): Pupils of moderate size, react sluggishly to light; the examination of the fundus shows an optic atrophy and the characteristic cherry-red spot at the region of the macula lutea. Examination of the chest shows nothing abnormal. The abdomen is markedly distended; the patient is obstinately constipated. The liver and spleen are not enlarged. The extremities are somewhat spastic, the reflexes increased, the Wassermann and von Pirquet tests negative. After the patient's discharge from the hospital he was frequently examined. The principal symptoms were: Very frequent convulsions, often as many as ten a day; obstinate constipation, apparently due to a marked atony of the bowels. The head continued to increase in size, so that on May 3, 1915, it measured 20¼ inches. In addition to the symptoms already noted there was observed fibrillary contractions of the upper eyelids, a peculiar snoring respiration and some difficulty in swallowing.

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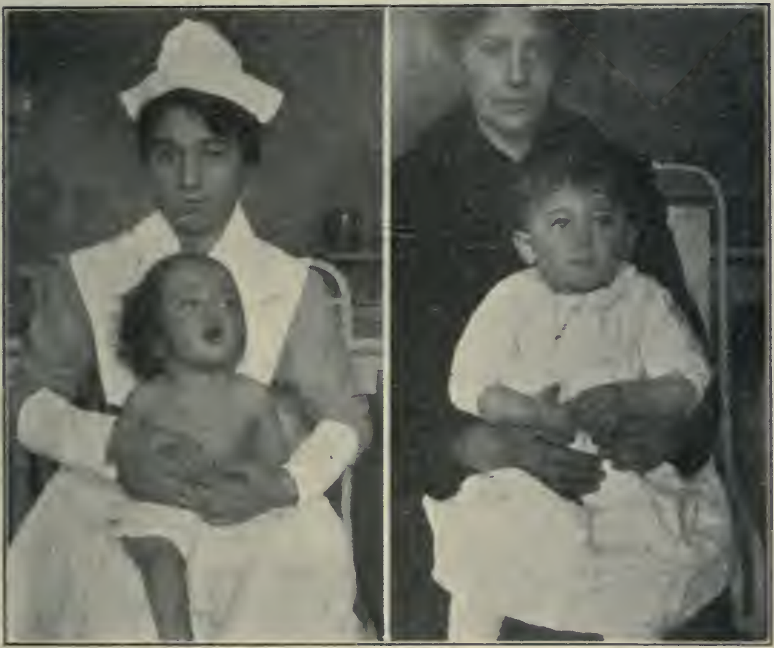
* Presented at the Annual Meeting of the American Pediatric Society, held May 25, 1915, at Lakewood, N. J.

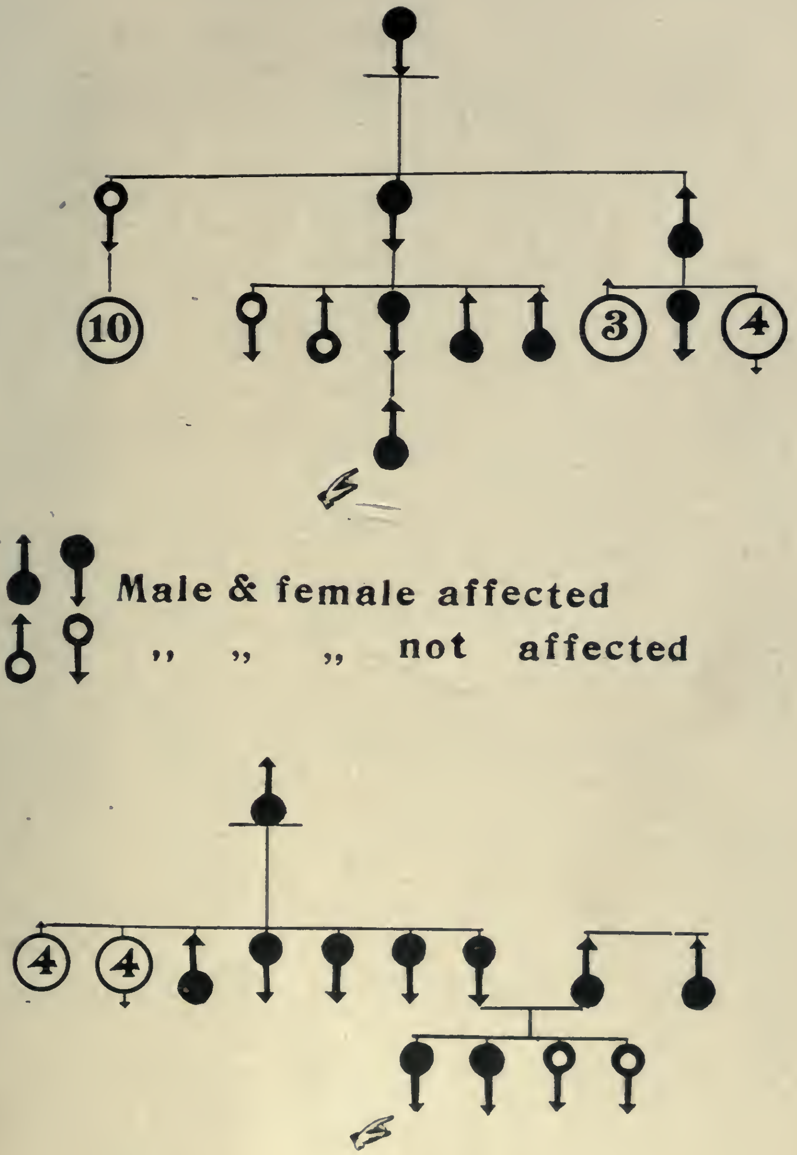


Amaurotic family idiocy. Normal child.

Fig. 1. Twins twenty months old.

The pathology, symptomatology and diagnosis of this disease are so well known that I shall only discuss briefly the etiology, upon which the present case throws some light, at least in a negative way. Alcohol and syphilis have been suggested as possible factors. Aside from the fact that they do not appear in the history of the majority of the cases, it is difficult to understand how a constitutional disease in the mother, or anything which might occur during pregnancy, could affect only one of twins. Some years ago Hirsch held that the changes in the central nervous system were caused by toxic substances which were present in the mother's milk. These infants received the breast only two weeks and it is difficult to understand why it should be toxic for one child only. It is now pretty generally recognized that amaurotic family idiocy is a typical example of an "abiotic" family disease. The "Aufbrauchstheorie" of Edinger is practically the same as the "abiotrophy" of Gowers. These infants are born with a central nervous system which lacks vitality; there is a deficiency in stamina or staying power. The structures which are below par ("minderwertig") are able to meet the comparatively slight demands of the first few months; later, when these demands become greater, when they should be met by further development, the central nervous system fails to respond and degeneration results.

This explanation is, however, not entirely satisfactory. Sachs and Strauss state the matter thus: "The theory of an arrest of development has to be given up, since embryologists limit this term to the conception of an arrest due to the cessation of the normal morphological growth, whereas, so far as we know, the brain of the amaurotic idiot is morphologically normal at birth and for some time after. . . . The gray matter of the brain and spinal cord is morphologically well formed and, so far as we know, functionally normal up to the age of four or six months. Then there gradually occurs a degeneration of all the ganglion cells and a consequent loss of function. The tendency to this degeneration must be born with the child and must reside in the germ plasm. . . . It is, however, not sufficient merely to predicate an impairment of the germ plasm; this would not explain the normal development of the nervous system through the early months of infancy and its degeneration a few months later. We must suppose that at about the fourth or sixth month some endogenous factor, related to the metabolic processes of the body, intervenes and affects the cells which have inherited a lessened resistance to this agent. The factor may be



POLYDACTYLISM

Charts of the ancestry of two cases of polydactylism of the author's. The hand points to the patient. The numerals in circles show a number of children whose sex was unknown.

AMAUROTIC FAMILY IDIOCY

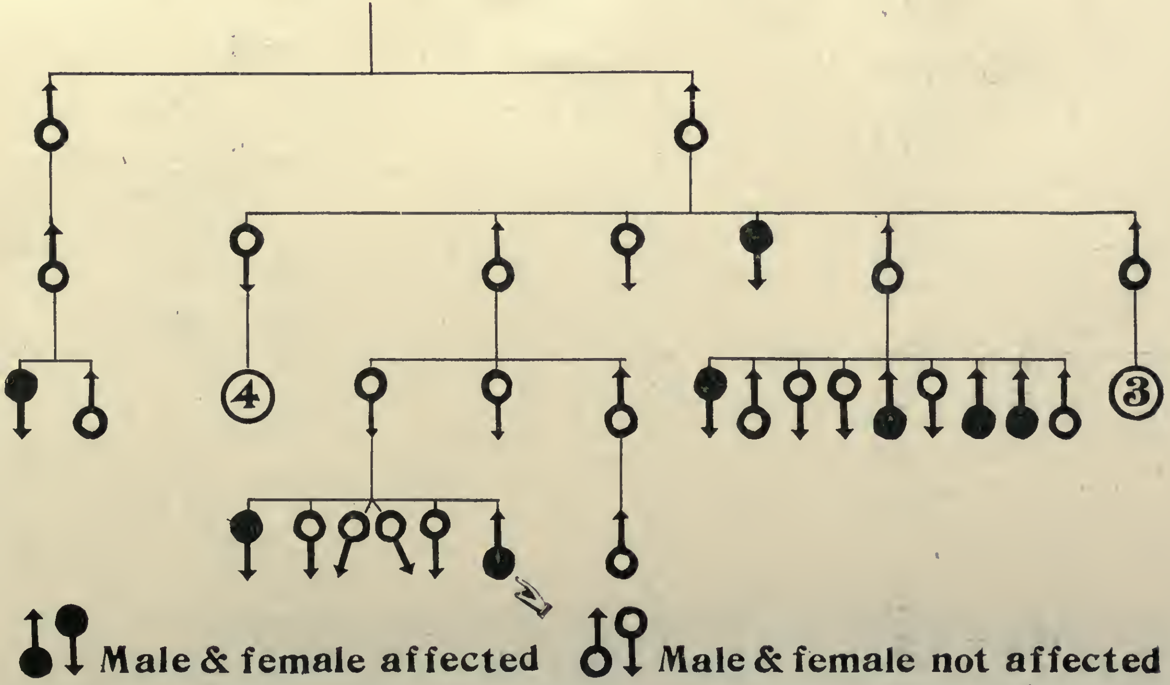


Chart showing the ancestry of a case of amaurotic family idiocy from Falkenheim. The hand points to the patient. The numerals in circles represent number of children whose sex was unknown.

one which is present in all children, but does not affect the nervous system of those who are not born with this inherited weakness." In this connection it is interesting to note that infants under five months are practically immune to measles, a disease to which all other individuals are very susceptible. Possibly at that age some fundamental change (physiological, biochemical) takes place.

About 100 cases of this disease have been reported; many more have not been recognized or reported. On the other hand, the same case is sometimes reported by the two observers. I have had 11 cases under observation during the last sixteen years, and I believe it is not at all unlikely that most of these were seen at some time or other by at least one other physician.

It has been frequently stated that the disease is rare in Russia and that it appears in the children of Russian parentage after they have emigrated to this country. This is, I believe, an error; 35 cases have been reported by Russian physicians and two have reported 12 cases each. Kowarski, in the course of two years, observed 6 and obtained the histories of 6 additional. That the condition may be overlooked in the early stage, even by a physician familiar with the disease is shown by the fact that the latter author in 2 of his patients made the diagnosis of rickets on the first examination. The majority of the cases have been reported from the larger cities in which there is a medical faculty attached to the university. Many of the Hebrew emigrants come from the smaller towns of the northwestern part of Russia, where naturally the physicians would be less familiar with this comparatively rare condition. When they emigrate a large number remain in New York City and therefore quite naturally a large number of these patients have been observed and reported by New York physicians familiar with the disease. The larger number of patients among children of Hebrew parentage, the rôle of consanguinity, and the mode of transmission can, I believe, be best understood on the basis of the Mendelian principles of heredity. (Chart 1, Falkenheim's case.) It will be readily seen that even if there were originally two Hebrew ancestors who had the unfortunate unit-character to one Christian the disproportion would become very much greater in the course of a few generations. The fact that the Russian Hebrews frequently intermarry is also important. Consanguinity is important in so far as the parents having two grandparents in common, if there are any unfavorable "unit-characters" in the ancestry, the offspring will get a double dose and will therefore run a double risk. The "unit-characters" which are involved in amaurotic family idiocy are evidently of the "recessive" type; that is, they may be transmitted through individuals who themselves show no evidence of this disease. In them they are latent or concealed. Chart 2 (showing the families of 2 cases of polydactylism which I have had under treatment recently) represents examples of unit-characters of the "dominant" type; that is, the condition is transmitted only through individuals who are affected.

250 West Eighty-eighth Street.

OPERATIVE TREATMENT OF CLEFT PALATE—In the Hunterian lecture, H. Blakeway (Lancet, March 6 and 13, 1915) states that in cases of cleft of the soft palate alone, or of the soft palate and a small part of the hard, there is probably little to choose between the results of the operation of median suture and of that of the turn-over flap in cases treated by the best hands; but that in cases of greater severity there is a much better prospect of success if Langenbeck's operation is used at a suitable age by a surgeon accustomed to its performance. Langenbeck's operation is still the best for routine use. The question as to the best age for its performance does not admit of precise answer. It is doubtful if any great advantage results from performing it during the first year of life, and it is certain that the prospect of success during the second or third year will often be better. Further delay is not usually necessary, but may in bad cases be advisable. Surgeons who a few years ago were content to operate in the third year or later now often perform median suture on children one or two years old. The experience of the operator, the width of the cleft, together with the height of the palatal arch and the general health of the child, have all to be considered before a decision is reached. If the condition is complicated by the presence of a harelip, closure of the latter during the first few weeks of life has a valuable effect in causing obliteration of the most anterior part of the cleft.—*The American Journal of Obstetrics.*

MACEWEN'S SIGN

An Analysis of the Anatomical Conditions which Enter into the Production of this Sign and of the Value of Its Presence in Diagnosticating Changes in Intracranial Pressure.*

BY HERBERT B. WILCOX, M.D.
New York City

Percussion of the skull to elicit changes in the note produced by intracranial lesions offers at times valuable additional information as to the existence of disease in the brain and its coverings. That an increase of the spinal fluid does produce marked effect upon the percussion note of the skull is a fact which has been noted by various writers during the past thirty-three years.

Macewen first referred to skull percussion in connection with the symptoms and diagnosis of brain abscess. He made use of it for some ten years and found it an aid to diagnosis. He considered the note to be caused by vibrations occurring in the cranial walls and to be influenced by the condition of the cranial contents and their relation to the parietes. Frozen sections made through the heads of hydrocephalic children showed the meninges to be closely crowded against the bony walls. He stated that a thin skull vibrates more readily than a thick one, *but* that a skull may be *so* thin or *so* thick that it cannot vibrate at all, and that in the cranium of an infant the note is so dull, slight and flat as to be scarcely perceptible. If, however, increased intracranial tension subjects the parietes to pressure the note becomes clear.

The diagnostic value of the sign has been questioned by some, perhaps largely because as yet there has been no definite attempt made to classify skull percussion with reference to the size. density of the skull, stage of development of the bones, age of the individual, and influence of disease upon these bones. In order to conclude anything from such percussion there must first be established a normal note for the various sorts of skulls that come under observation, as is recognized in the percussion of the chest in the infant or adult with thin or thick walls.

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* Presented at the Annual Meeting of the American Pediatric Society, held May 25, 1915, at Lakewood, N. J.

It is such an analysis of the notes produced by percussion of the skulls of children from birth to twelve years of age, children who are normal as to their osseous development, or those who have suffered in this respect through rickets or other disease resulting in malnutrition, that is the basis of this paper. The observations were made on the service of Dr. L. E. LaFétra at Bellevue Hospital and in the dispensary connected therewith during the years of 1911 to 1914.

As percussion of any portion of the body gives us its information by vibrations set up both in the parts underlying the area percussed and in the structures making up the body wall at that point, so skull percussion may be expected to vary both with differences in tension in the brain and its coverings and in density of the cranial bones themselves.

Of great influence upon this percussion note is, first, the age of the child, determining the thickness and density of the bones; second, the condition of the sutures; and, third, the size of the fontanels. Different normal percussion notes belong to varying ages, with their corresponding states of skull development. Disease influences the character of skull percussion, rickets, of course, being the best example of this.

Such variations are, then, physiologic and pathologic in causation. Physiologic when depending upon the natural changes which occur in the growth and development of the cranial bones, sutures, fontanels and sinuses; pathologic when such changes are accentuated by disease or disturbance in development, and when they accompany abnormal conditions of the brain, meninges or spinal fluid.

Percussion of a hydrocephalic skull or of a skull with wide-open fontanels, with open sutures, or marked cranio-tabes, will differ from that of the thickened skull attendant upon retarded cerebral development. What is true of the cranium itself is equally true of its contents, for as changes in the condition of any viscus under investigation influence the note produced by percussion, so pathologic changes affecting the density or tension of the skull contents will influence its percussion.

Notes produced by such percussion are also affected by position. Percussion of a skull resting upon the pillow will be markedly different from the percussion of the same when supported by the hand.

If the variations in the normal skull percussion mentioned are recognized and allowed for, then deviation from that normal note may reasonably be considered to be brought about by changes occurring in the cranial contents. Such changes may be those known to be present in the brain and meninges in hydrocephalus in all its forms—in brain tumors, in the acute infections of the meninges, in some chronic changes which occur from infection in the brain and its coverings, in the changes attendant upon injury such as hemorrhage from fracture.

Crania which have been subjected to the influence of disease and are therefore deficient in density and in the state of fontanels and sutures, present percussion notes varying from the infantile type to a type nearly normal to their age, according to the degree of developmental interference.

A rachitic skull at six years will give a percussion note similar to that found normally in an infant of six months. If this case develops increased spinal fluid, a sharp, high-pitched, clear note is at once found to have replaced the former dull, low-pitched, non-resonant percussion.

In congenital hydrocephalus or that occurring so early in infancy that the cranial walls consist of thin fibrous plates with large fontanels and sutures completely open, no note is obtained on percussion. Even when the tension is great there is no structure present suitable to the production of vibrations.

If the disease has developed later in a normally ossified cranium the note will be *most* typically "cracked-pot" when the sutures are loose but not widely separated. If the latter are widely separated the note will be high-pitched, sharp and ringing, but will have less of the cracked-pot quality.

Our interest in the subject began with the admission to our service of a boy of seven years because of increasing spasticity of the legs and inability to walk, dating from an appendicectomy performed three months previously. His history, aside from the appendicitis, was normal. The mental and physical development had been in no way different from the other children in the family. His teachers reported him to be unusually bright. He had none of the symptoms of hydrocephalus and was not considered as such until attention was drawn to the true condition through the discovery of a striking Macewen. Subsequent findings, confirmed at autopsy, established the diagnosis of early, arrested and quiescent hydrocephalus with exacerbation occurring at the time of his operation.

Less easily proven as accompanying actual intracranial changes are certain variations in skull percussion observed in acute and chronic febrile conditions which do not warrant spinal puncture. Typical Macewen's note is sometimes found in febrile conditions without evidence of cerebral involvement. In the routine examination of a number of children the sign was found often in children with high temperature due to gastrointestinal disturbances, in pneumonia, in typhoid fever and in influenza. This does not mean, however, that the sign is any less valuable than some others that accompany and indicate organic lesions, but which may also be produced by transitory and unimportant functional disturbances. For example, the fact that a loud systolic murmur heard over the heart may be produced by slight dilatation of the right or left conus and disappear entirely in a short time does not detract from the importance that is rightly attached to this murmur, when present as the result of an organic lesion.

Explaining the occurrence of Macewen's phenomenon in patients free from disease of the central nervous system is the fact that a temporary increase in volume of spinal fluid, under pressure, frequently occurs in febrile states not associated with cerebral or meningeal lesion. Macewen's sign has been noted in patients who, on lumbar puncture, show no increase of fluid. In three such instances, however, a large amount of fluid was demonstrated in the brain, twice at autopsy and once by puncture of the ventricle, failure to obtain fluid by lumbar puncture being due to occlusion of the foramen leading from the ventricles to the cord. The presence of the sign need not be confusing, therefore, under such conditions.

Macewen's sign is best determined by the stethoscope placed on the forehead just above the base of the nose. The skull is tapped, directly, with the percussing finger or hammer over the parietal region, beginning just over the parietal boss, from which the percussing finger should approach the point at which the stethoscope is applied. This should be carried out on both sides of the head.

The typical sign, observed in this way, consists in a high-pitched, sharp, short, cracked-pot note. It is most distinct when percussion is being done over, behind or below the parietal boss on either side, is unchanged as the point percussed passes downward, and diminishes in intensity and character as the percussing finger approaches the stethoscope. The latter point is important and is valuable in differentiating between a false and true Macewen sign, as the reverse obtains in percussing the normal skull. That is, the nearer to the point of listening the tapping is done, the more loudly the note is heard. This is apparently due to the fact that under normal conditions vibrations are better conducted along the bony wall than through the brain and meninges. On the other hand, when there is increased intracranial tension the skull content plays a more active part in the transmission of vibrations, and the further away from the stethoscope the percussion is done the greater is its influence on the note and the less that of surface conduction. Reason for this belief was repeatedly found in our cases in the observation of the above changes in percussing skulls before and after removal of a considerable amount of spinal fluid.

The percussion note of normal children's skulls varies, as has been stated, with the density of the bones, the size of the fontanels, and the condition of the sutures. In general such variation is comparable to the difference in depth, clearness, and intensity of the tone produced by a drum with intact walls and taut heads and by one whose heads are loosely strung or whose sides are cracked. Each of these above conditions is susceptible to modification with a corresponding resultant change in the tone. Thus the soft skull with open fontanel and loosely woven sutures gives normally almost no vibratory sound when struck. If such a skull is subjected to increased intracranial pressure, then the percussion note will be changed and, although not typical of the sign found in older children, will be relatively striking.

This cracked-pot note of Macewen is to be considered as a relative variation from the normal. Most authors seem to look upon it as a definite entity, the contention of Hessman and Feldstein being that Macewen's sign is of no significance in children before the closure of the fontanel. They consider the sign to mean a bulging fontanel *before* its closure, and a cracked-pot percussion note *after* such closure.

After a study of skull percussion in a large number of infants in health and disease, it seems quite practical to establish a note normal to these early stages of development definite enough to make the deviations accompanying intracranial changes of unquestionable value. This has proven true of the infant as well as of the older child.

A child of seven months was admitted with symptoms of meningitis. The percussion note normal to a skull of this age, with fontanel measuring one inch in diameter, would be low pitched and soft. On percussing this child's skull, however, a typical Macewen note was obtained. The cord was tapped and 30 c.c. of purulent fluid was removed and found to contain the influenza bacillus. After tapping, the percussion note obtained was that as above-described, normal to a skull of this age.

An infant of six months, poorly nourished, with wide-open anterior and posterior fontanels and soft sutures, was admitted with retracted head and fever. The percussion of such a skull should normally give a note even less resonant than that of the first case mentioned. It was found, however, a little high-pitched, too loud and too clear for a skull in this condition. The note was characteristic not in its quality so much as in the fact that, as the percussing finger moved toward the point at which the stethoscope was applied to the forehead, the note became less distinct than when the percussing was done over the parietal boss. This cord was tapped and 15 c.c. of fluid was obtained under great pressure. After tapping, the percussion note returned to normal for a skull of this type and the note was louder when tapping was done near the stethoscope than when further away. These 2 cases illustrate the facts that a typical Macewen note may be obtained in a skull whose fontanels are still open, and that for purposes of diagnosis it is a change in the percussion note expected rather than the presence of the typical note which is of importance.

A group of infants under six months of age, and normal as to their central nervous systems, were studied as to skull resonance. The note common to this age is low-pitched, non-resonant and dull. Among them were a number with increased spinal fluid and tense fontanels. In one case a typical Macewen's sign was found, which disappeared after the removal of 15 c.c. of spinal fluid under marked pressure. A case of tuberculous meningitis six months of age had at first a percussion note high enough pitched to be suggestive and later a typical cracked-pot note. An infant of fourteen weeks gave a skull percussion definitely abnormal for his age, which was noted as a "dull Macewen" two days before a lumbar puncture was done. Forty-two c.c. of fluid was removed and a diagnosis of tubercular meningitis was made.

It is, then, apparent that infants may present a typical Macewen's sign. On the other hand, of equal diagnostic value is the difference which may be noted in the infant with increased intracranial pressure and the note common to a normal infant of the same age.

The incidence of this sign in cases of meningeal involvement of all types was observed in relation to the age, condition of the skull, amount of spinal fluid, pressure of fluid and other symptoms of cerebral and meningeal disease.

Fifty-three cases of tuberculous meningitis were so analyzed. The sign was present in 50, absent in 2 and doubtful in 1. Of the 50 positive cases, 19 were under great pressure, 18 showed moderate pressure, 6 showed no increase in pressure, and in 7 the point was not noted.

The amount of spinal fluid varied directly with the pressure, except in 3 cases, where 40 to 60 c.c. of fluid was obtained under no increased pressure.

Of the 51 cases of tuberculous meningitis showing a positive Macewen's sign, 6 were less than one year, 29 were between one and two years, and 16 were over two years. The children having questionable Macewen's sign were eight months and eleven years old respectively, the negative case six years old. Macewen's sign was noted in all but 5 instances, either before or at the same time as the development of other cerebral symptoms.

Eighteen cases of acute meningitis of various types other than tuberculous were observed, among which there was only 1 in which Macewen's sign was lacking. This was an epidemic type, in a child two years old, with little fluid under no pressure. There were 3 children less than one year of age; 1 between one and two years, and 12 over two years. The pressure was greatly increased in 5 cases, moderate in 10 cases, and low in 3 cases. Macewen's sign was noted early in every instance.

Five cases of poliomyelitis all gave positive Macewen's sign, with reduction in its intensity after removal of spinal fluid. Two children in this group were six months old; the others between four and eight years. Increased pressure obtained in 4 cases, the fluid varying between 15 and 25 c.c. in quantity.

Two children were admitted for chronic otitis with marked symptoms of meningeal irritation. Their spinal fluids showed increased volume and pressure, but nothing abnormal on analysis. The Macewen's sign was strongly positive at first and persisted so long as the cerebral signs continued. The intensity diminished as the general condition of the patients improved and it was negative on their discharge. In these 2 instances the evidence obtained from skull percussion tallied exactly with the development of other symptoms and was of value in estimating the necessity for repeated spinal puncture.

Because of the more or less marked cerebral symptoms the Macewen test was applied to 13 cases of pneumonia. In 5 of these, lumbar puncture was considered justifiable and an increase of normal spinal fluid under pressure was demonstrated. Nine children were between one and two years; 4 were over two years. The spinal fluid was increased and under pressure in 5. In 8 no puncture was done. Macewen's sign was positive in 11 cases, questionable in 1 and negative in 1, the latter 2 cases being among those not tapped. These facts are of interest simply in corroboration of the belief that when, as a complication of a non-meningeal affection, the spinal fluid becomes increased, the Macewen's sign is always present and that conversely the presence of the sign invariably indicates such intracranial alteration.

CONCLUSIONS

(1) The skulls of children of various ages and development have percussion notes peculiar to the state of the cranium.

(2) It is possible to establish a note normal to the various types of crania found in infants and children.

(3) A positive Macewen's sign exists when variation from the normal note is found. It consists in a relative change rather than a definite condition common to all diseased crania.

(4) The sign is better elicited by the stethoscope than by the unaided ear.

(5) Increased clearness of sound when percussion is done over the posterior portion of the skull rather than near the stethoscope is diagnostic.

(6) The sign uniformly accompanies conditions of increased intracranial tension, and is not found unless this causative factor exists.

(7) It is equally applicable to infants and older children.

(8) It was present in 50 of 53 cases of tuberculous meningitis.

(9) It was present in 17 of 18 cases of meningitis of other types.

(10) It was present in all of 5 cases of poliomyelitis.

(11) It was found to vary directly with the development and recession of cerebral symptoms as complications of disease not directly affecting the central nervous system.

(12) It was present in 11 of 13 cases of pneumonia, in 5 of which lumbar puncture showed increased cerebrospinal fluid under pressure.

(13) The sign is uniformly lacking in children normal as to the brain and its coverings.

159 East Seventieth Street.

CONGENITAL HEMIHYPERTROPHY—J. M. Fortescue-Brickdale (The Lancet, July 3, 1915) reports the case of a male infant nine months of age in whom several months after birth the whole of the right side of the body was noticed to be larger than the left. The condition was recognized as one of congenital hemihypertrophy, of which there are the following groups: (1) Congenital elephantiasis or trophedema; (2) simple congenital hypertrophy of one or more limbs or of one side of the body ("true" or "false"); (3) intermediate cases, in which there is some general hypertrophy of a segment of the body and also a congenital tumor of a special tissue, and (4) congenital tumors involving a limb. The case described falls into the second group, the main characteristics of which may be summarized as follows: The condition is congenital and may involve a large or small area of the body, from a few digits to the whole of one side. The hypertrophy involves all tissues, but is more marked in the soft structures than in the bones, and thus usually affects the girth more than the length of the limbs. In one remarkable case reported by Reissmann the right side of the body and the left side of the head were involved, while in Ballance's case there was hemihypertrophy of the left side of the face with enlargement of the second and third toes of the left foot, and the third and fourth of the right. The boy was also said to be "rather simple." In Friedrich's case the opposite arm and leg were involved. The appendages of the skin, nails and hair, may or may not be involved; and in some instances the temperature on the affected side is higher. The right side is more frequently enlarged than the left and the lower extremity than the upper. Males are more frequently affected than females, and there is seldom any family history of other congenital deformities.—*Medical Record.*

MISCELLANY

EDITOR OF ARCHIVES OF PEDIATRICS:

Dear Sir: December 25, 1915.

To-day is a solemn and bountiful day for millions. It strikes me that I owe a present to my colleagues all over. That present is to be a warning. When half a year ago I saw the article extracted by your M. S. R. on your page 872, I felt I had lived and taught in vain. My only consolation was that not many would read, and still fewer would mind it. Life is too short, duties are too many, printing is too vast, literary "efforts" are too numerous, and still, some of us will be swamped. Your M. S. R. has condensed much danger in a few lines referring to an article on "Therapy of Pneumonia in Children," published by a deservedly famous man who has benefited Pediatrics these forty years and is lured into contributions to all sorts of publications by admirers and publishers. The article abstracted by M. S. R. is dangerous. It has even compelled me to write and write again as in former decades and raise a voice of warning.

The author says he does not desire to teach therapeutic nihilism so much as to recommend the disuse of measures which have no beneficial effect. We thank him for that. It was said before, and every teacher will do so again to the end of time. He has seen "a number of cases of pneumonia which recovered without the use of any drug." So have you, and "vis medicatrix naturæ" has been quoted a billion times by good and bad doctors. "Every needless and superfluous medicament causes considerable harm." That teaching is incorrect, or harmless, or may be misguiding.

"The child has considerable resistance to pathologic results, infections and intoxications, and this resistance responds to slight therapeutic assistance. Therefore it is necessary to call upon the severer means and methods only when the most urgent indications are present."

Now, which are the most urgent indications? They change from decade to decade. A hundred years ago of thirty-five sick, one would recover; at present of thirty-five sick, one will die. It appears, therefore, that prognosis and indication and urgency have unstable interpretations. Surely urgency does not always mean the undertaker's wagon. But to wait for "severer means and methods" until they are late, and come too late, may mean death, and often means death or eternal invalidism.

Your "severer means and methods" remind me of many of our masterpieces of operative surgery. They are "successful," and the artist is congratulated, and it takes you two days before the obituary notice appears in the morning paper. If the long list of medicaments enumerated by M. S. R.'s abstract had been employed in due time, before "the critical moment," it would have been better for the patient and the practitioner's result and operation. But after all do not jumble about in the jungle of cruelly incompatible or inappropriate drugs.

That is where the trouble comes in. Many of our young or youngest practitioners are liable to be taken off their feet by the warning of "polypharmacy" or the hope of "vis medicatrix." If you were not taught materia medica and therapy by your school, you are liable to be impressed with the teaching that "no drug" is best after all, and that you must not meddle with nature that will find the road to the cemetery without you.

Mr. Editor, I wish to be brief, our practitioner with American common sense knows there is no therapy for "pneumonia." Our individual sick have each their own individual pneumonia, as each of them has his own individual doctor, but no profession or faculty to attend to him. Whoever has knowledge enough to understand warm or cold water, warm or cold air, and the virtues of digitalis and camphor and ammonia and opium, is safe enough when he uses them. Deprive him of drugs and you will cripple him as you emasculate a surgeon whom you rob of his knife. Both require brains, but also tools.

I am very much afraid however that our young graduates are not yet sufficiently acquainted with the advantages of our therapy, both physical and medicinal, and that our schools are still missing some opportunities of making good doctors for our friends and masters, the people.

If I were to give any medical suggestions for the management of a child taken with some form of pneumonia, they may differ in the lobar and lobular form, beside the interstitial. Never forget, however, that every succeeding day of an infectious fever reduces the power of the heart and indicates a moderate dose of digitalis, or caffein, or spartein; no alcohol if any for a number of days; ammonium (not the useless chloride, but perhaps anisateum, no carbonate in order to spare the stomach). My faith in camphor has not been disappointed these sixty years.

A. Jacobi, M.D.

SOCIETY REPORT

JOINT MEETING OF THE NEW ENGLAND PEDIATRIC SOCIETY, PEDIATRIC SECTION OF THE NEW YORK ACADEMY OF MEDICINE AND THE PHILADELPHIA PEDIATRIC SOCIETY

The Joint Meeting of the New England Pediatric Society, the Pediatric Section of the New York Academy of Medicine and the Philadelphia Pediatric Society, was held in Philadelphia November 9, 1915.

The programme for the day was as follows:

9:30 to 9:55 A.M.—Inspection of the new Henry Phipps Institute of the University of Pennsylvania for the Study, Prevention and Treatment of Tuberculosis, at Seventh and Lombard Streets. Dr. H. R. M. Landis, Director.

10:00 to 10:40 A.M.—Dr. E. E. Graham showed some interesting cases in the Clinical Amphitheatre, Jefferson Hospital, Tenth and Sansom Streets.

10:45 to 11:40 A.M.—The Health Center of the Child Federation, Twelfth and Carpenter Streets was visited, where Dr. S. McC. Hamill explained the intensive work there being conducted for the prevention of disease in a congested foreign quarter of the city.

11:45 to 12:00 M.—Inspection of the first unit of the new group of buildings of the Children's Hospital of Philadelphia. Eighteenth and Fitzwater Streets, under the guidance of Dr. J. Claxton Gittings.

12:10 P.M.—Visit to the new Children's Building of The Woman's Hospital of Philadelphia, Twenty-second Street and North College Avenue, under the direction of Dr. Eleanor C. Jones.

12:30 P.M.—A Buffet Luncheon was served to the visitors through the courtesy of The Woman's Hospital.

2:00 to 2:50 P.M.—At the Hospital of the University of Pennsylvania, Spruce Street above Thirty-fourth Street, in the Medical Amphitheatre, Dr. William G. Spiller gave a clinic on Nervous Diseases in Children.

2:55 to 3:25 P.M.—At the Laboratories of Pathology, Physiology and Pharmacology of the University of Pennsylvania, in the Department of Research Medicine, three ten-minute talks were given as follows:

1. Dr. Richard M. Pearce—Metabolism Studies before and after Splenectomy in Congenital Hemolytic Icterus.
2. Dr. Alonzo E. Taylor—Acidosis in Children.
3. Dr. E. B. Krumbhaar—Electro-cardographic tracings in children.

3:30 to 4:00 P.M.—In the Medical Laboratories' Building, Dr. T. B. Weisenburg gave an exhibition of motion pictures of Cerebellar Symptomatology and Epilepsy—Jacksonian and General.

4:10 to 4:40 P.M.—At the Wistar Institute of Anatomy and Biology, Dr. Helen D. King demonstrated the subect of "Consanguinity in the White Rat."

4:45 P.M.—At the Polyclinic Hospital, Dr. Jay F. Schamberg held a clinic on Skin Diseases in Children.

6:30 P.M.—Dinner at the Manufacturers' Club.

8:30 P.M.—Evening programme, Thompson Hall, College of Physicians.

Dr. Howard H. Mason of New York—"Lobar Pneumonia; the Co-Relation of its Symptoms and Physical Signs with the Findings of the Roentgen Ray."

Dr. Charles Hunter Dunn of Boston—"Studies on Tuberculosis in Infancy."

Dr. John A. Kolmer, Dr. Samuel S. Woody, Dr. Emily L. Moshage of Philadelphia—"Experimental Studies and Clinical Value of the Guinea Pig Test for the Virulence of the Diphtheria Bacilli."

ABSTRACT OF SCIENTIFIC SESSION

Dr. William A. Bradley, President of the Philadelphia Pediatric Society in the chair.

"LOBAR PNEUMONIA; THE CO-RELATION OF ITS SYMPTOMS AND PHYSICAL SIGNS WITH THE FINDINGS OF THE ROENTGEN RAY"

Dr. Howard H. Mason of New York City, said that during the past two years at the Presbyterian Hospital of New York all the cases of lobar pneumonia in children have been X-rayed at least once, and some have repeated roentgenograms. From the study of 37 uncomplicated cases of lobar pneumonia, Dr. Mason deducts the following interesting facts. They all showed definite shadows which were always quite dense and uniform, and usually definitely outlined. In every case the shadow was so situated that the consolidation touched the pleura at some point, the greater part of the shadow always lying close to the pleura, while the depth to which the shadow extended varied in different cases and at different stages of the same case. From the physical examination of these cases it seemed to be proven that the base of the triangular shadow was the part close to the pleura while the apex of the triangle was the deeply situated part of the consolidation. Of the 37 cases, 15 showed in the first roentgenogram a uniformly dense shadow extending over all or almost all of at least one lobe. Seven of the cases showed median shadows, that is, shadows which touched the normal mediastinal shadows, but did not extend to the lateral margin of the lung. In 13 cases the shadow was lateral, that is it touched the lateral periphery of the lung but did not extend to the normal mediastinal shadow. Of these 13 cases Dr. Mason noted that at first they were always triangular in shape with the base of the triangle on some portion of the periphery of the lung and the apex directed toward the root of the lung. The most frequent site of the base of the triangle was opposite the upper part of the axilla. They spread upward and downward and toward the root of the lung, gradually increasing until just before the crisis. Occasionally they spread along the surface of the lung and not toward the root. In the early stages there was a relatively clear area between the apex of the shadow and the root of the lung. As the shadow spread it obliterated this clear area until in most cases there was a uniform dense shadow extending from the lateral surface of the lung to the root. Thus there seemed to be at first a small conical shaped consolidation, the base of the cone lying in the plane of the lung periphery and the apex of the cone pointing toward the hilum. This cone of consolidation gradually becomes larger and larger until finally its apex reaches the hilum and its base coincides with all—or with the larger part—of the pleural surface of the lobe. The process seems therefore to begin in that portion of the lung which is anatomically farthest from the hilum, that is, the part which lies close to the pleura. In all of these cases bronchial voice and breath sounds were present when the shadow extended from the lateral surface of the lung to the region of the root, and they were absent when the shadow was separated from the region of the root by an area of normal lung shadow.

In summarizing, Dr. Mason brought out the following points:

SUMMARY

Thirty-seven cases of lobar pneumonia were studied with the roentgen rays, most of them repeatedly. All 37 cases showed a definite shadow.

The shadow was always so placed that it touched the pleura at some point.

The early shadows were triangular in shape, with their bases on the pleura and their apices separated from the region of the root by normal lung.

In their later development, the shadows extended in size and became uniform from the periphery to the root of the lung. When the shadow involved this entire stretch, bronchial voice and breathing were present, but not otherwise. It is believed that the inference is justified that the dimensions of the shadows correspond to the extension of consolidation.

The following conclusions may, therefore, be drawn:

1. The consolidation of lobar pneumonia in children begins in that portion of the lung which lies just beneath the pleura.

2. A central pneumonia in the strict sense never occurs. Silent consolidations are subpleural consolidations and are separated from the hilum by normal lung.

3. Bronchial breath and voice sounds are dependent upon the presence of a medium of comparatively uniform density from the site of their origin (the trachea and large bronchi) to the

point where the ear or stethoscope is applied. These conditions are fulfilled when the consolidated area extends from just beneath the ear to the region of the hilum.

Dr. Leon T. LeWald, of New York, in discussing Dr. Mason's paper, exhibited a number of lantern slides that were confirmatory of Dr. Mason's conclusions. One case of very early pneumonia showed the practical application of Dr. Mason's work. The first slides shown illustrated the bronchial tree after injection through the bronchoscope; these had been made with the assistance of Dr. H. L. Lynah and showed that there was normally a dense shadow about the hilus on each side and this had led to many misinterpretations of radiographs and to the diagnosis of tuberculosis when in reality there was nothing abnormal in the region of the hilus. Another slide showed a roentgenogram of a child who was taken ill suddenly and complained of pain in the right lower quadrant of the abdomen. There were other physical signs suggestive of appendicitis, but there were very few suggestive of pneumonia. Indeed it was impossible to tell from the physical signs whether one was dealing with a pneumonia or an appendicitis. The radiograph showed an area of consolidation in the right lung, and the diagnosis of pneumonia was made. On the following day a definite pneumonia could be made out and the child went on to crisis and recovery. This case demonstrated the utility of radiography, for otherwise the child would have been subjected to an altogether unnecessary operation. The next slide shown emphasized the necessity of radiographing a child in the presence of conditions that were not readily recognized. The subject of this picture was suffering from symptoms which were thought to indicate the necessity for a rib resection. No X-ray examination was asked for and the operation was performed. The child received no relief and was later radiographed and a foreign body, an upholstery tack, was located in the right bronchus. Upon careful inquiry it was found that this tack had been lodged there for two years. Dr. Nathan Green removed this tack through the bronchoscope by means of an electromagnet. The last slide exhibited showed a wedge-shaped shadow which might easily have been mistaken for an encysted pleuritic effusion, but it resolved of itself as was disclosed by confirmatory radiographs; this also showed how a mistake might have been made and an unnecessary operation performed.

STUDIES ON TUBERCULOSIS IN INFANCY

Dr. Charles Hunter Dunn of Boston, said that the literature of tuberculosis was so enormous and complete that it was difficult to add anything new to our knowledge of this subject. He had been impressed with the fact that in many articles the conclusions drawn were not supported by the final proof afforded by a postmortem examination. The importance of tuberculosis as a cause of death in the first two years of life is shown by the fact that in a series of 62 successive autopsies in the Infants' Hospital, Boston, tuberculosis was found in 25, and was considered the direct cause of death in 23 cases. In general the reports of postmortem findings show a greater frequency of involvement of the peribronchial and mediastinal lymphnodes than of the mesenteric. Dr. Dunn thinks that it may be possible but not probable that the tubercle bacillus can enter the body of the infant without a lesion at the portal of entry, but this is still an open question. He does not believe that the bacillus can escape one set of lymph nodes to locate in another. In Dr. Dunn's series of autopsies the lungs were cut up into the smallest fragments in search for the primary lesion. As a result a primary lesion was actually found at the portal of entry in 22 of the 25 postmortems. The primary lesion was found in the lungs in 20 cases and in the intestines in 2 cases, which suggested that in Boston at least the most frequent mode of infection is by the inhalation of the tubercle bacillus from a human source, but that the infection through the ingestion of the bovine bacillus in contaminated milk may occur. The primary lesion in the lung is quite easily recognizable. In most cases it was a circular area varying in size from that of a pea to that of a hazel nut. The center was caseous, but usually of a grayer color than the yellowish-white caseation seen in the secondary lesions. In some there was caseous softening or small cavities. In one there was calcification. Around the periphery of some of the smaller lesions were numerous miliary tubercles suggesting direct extension. The favorite situations for the primary lesion in the lung were at the apex and near the hilus. The lesion which was found in the intestine in 2 cases and considered primary was a tuberculous ulceration, and while there was nothing about the appearance of these ulcerations differing from secondary ulcerations, they were considered primary because in them the mesenteric lymph nodes *only* were tuberculous and they were the only cases in which tuberculosis of the mesenteric lymphnodes was found without tuberculosis of the bronchial lymphnodes.

The bronchial lymphnodes were found tuberculous in the 20 cases having a primary lesion in the lung, and in 3 cases in which no primary lesion was found. Tuberculous ulcerations of the intestinal mucous membrane were found in 7 cases besides the 2 in which this lesion was considered primary. In all these cases the ulcerations were multiple. There was no case showing tuberculosis of the mesenteric lymphnodes without an intestinal lesion.

Other Secondary Lesions—Chronic tuberculosis of the lymphnodes was found in every case. A more or less generalized miliary tuberculosis or a tuberculous meningitis was found in 23 cases. In 2 cases were chronic lesions found only. Tuberculous peritonitis was found in 2 cases. Solitary tubercle of the brain was found in 1 case.

In 5 cases in this series animal inoculations were made to determine whether the infection was of the human or of the bovine type of bacillus. The bovine was found in 1 case and the human in 4 cases.

In this series of cases the diagnosis of the tuberculous nature of the disease was made during life in 23 out of 25 cases. There are three important points besides the existence of such definite manifestations as tuberculous meningitis or tuberculous peritonitis on which the diagnosis of tuberculosis in infancy is based. These are—first, the finding of physical signs suggesting tuberculosis in the chest; second, the evidence given by the tuberculin reaction; third, the evidence by roentgen ray examination of the chest. In this series of cases the cutaneous von Pirquet reaction was employed with the result that it was positive in 6 cases, and negative in 12 cases, and in the other 7 cases was not done. It must be remembered that many of these cases were acutely ill, and that the reaction was observed very shortly before death when resistence to infection was probably at a minimum. On the whole, Dr. Dunn is inclined to believe that the value of the cutaneous tuberculin reaction in infancy is not so great as many writers would lead us to suppose. A negative reaction seems to be a frequent finding in any stage of the disease and gives no evidence at all. A positive reaction in infancy means tuberculosis. Roentgen ray examination of the chest was made in 13 cases in the series, and was positive in every case.

THE PRACTICAL VALUE OF THE GUINEA-PIG TEST FOR THE VIRULENCE OF DIPHTHERIA BACILLI (BASED UPON 1,054 VIRULENCE TESTS)

This paper, written by John A. Kolmer, M.D., Ph.D., Samuel S. Woody, M.D., and Emily L. Moshage, M.D., was read by Dr. Kolmer.

Dr. Kolmer said that owing to the frequency of diphtheria and the comparative ease of making bacteriologic examination in this disease, the laboratory had been freely used as an aid in its diagnosis and management so that the bacteriology of diphtheria may be considered one of the best developed subjects in the domain of bacteriology.

The morphologic, biologic and tinctorial qualities of diphtheria bacilli are so distinctive that with comparatively little experience they are readily detected in properly made cultures, and if diphtheria bacilli were to be found on mucous membranes only in diphtheria and disappeared in a reasonable length of time after the clinical evidences of infection had disappeared, nothing would be simpler or more satisfactory than the bacteriologic diagnosis of the majority of these infections.

Following an attack of diphtheria the bacilli may persist for long periods of time on the mucous membranes even though the patient is in all respects restored to health. Most physicians have encountered these cases in their private and hospital practice when prolonged expensive and tiresome quarantine was necessary because of the possible danger of transmitting virulent bacilli to others, until repeated cultures showed the patient to be, temporarily at least, free of diphtheria bacilli.

We now know that these "carrier" cases, both the convalescent and the person who has never had clinical diphtheria, may carry either virulent and disease producing bacilli or non-virulent bacilli; in not a few instances both virulent and non-virulent forms are present on the same mucous membrane. In practice it would be simplicity itself to prolong the quarantine of all convalescents until repeated cultures show the absence of diphtheria bacilli and likewise to quarantine all healthy "carriers" who have been in contact with a person with clinical diphtheria. The procedures, however, may bring great hardship to a person or family by reason of prolonged isolation and detention; the attending physician may regard lengthy quarantine as a reflection upon his ability and a reversal of his opinion regarding the condition of his patient, and he may in this manner suffer in professional reputation.

It is readily understood, therefore, that some practical and reasonably sure means of differentiating virulent from non-virulent diphtheria bacilli is highly desirable. The test should be one that is easily applied; that is, sufficiently delicate to detect the potential harmfulness of bacilli with low grade virulence and it should give the result as quickly as possible.

Before any test, however delicate and accurate it may be, can be accepted as sufficiently safe in practical work to regard a "carrier" as free of danger to himself and others on its evidence, several important questions must be answered with reasonable positiveness. (1) Can bacilli that are without disease-producing powers, according to our tests, resume virulence and induce disease? (2) May not bacilli of low pathogenicity produce an infection in a second individual of low resistance while causing no apparent harm to the carrier? (3) May not virulent bacilli gradually lose virulence and later resume full pathogenic powers under conditions over which we have no control?

We have no reason to believe that in some instances the prolonged number of positive cultures following diphtheria are due to the presence of harmless diphtheria-like bacilli of "carriers" that had no connection with the attack of clinical diphtheria. They were present before the attack of diphtheria and are likely to remain for an indefinite time afterward. At first, they may be overgrown by the disease-producing bacilli or overlooked in cultures, but as the latter disappear the non-pathogens become prominent again and yield a formidable line of positive cultures.

It is clearly apparent, therefore, that some means of differentiating between pathogenic and non-pathogenic diphtheria bacilli must be available if the diagnosis and control of diphtheria is to be based upon bacteriologic examination.

The animal inoculation test remains as the only means now known for determining the virulence of a culture of diphtheria bacilli. To be reliable and satisfactory as a practical measure an animal inoculation test must fulfill certain fundamental requirements.

I. It must be specific and sufficiently delicate to detect the pathogenicity of bacilli of low virulence on the basis that such bacilli may be capable of harm when transferred to the mucous membranes of persons less susceptible than the carrier.

II. The test must be simple and easily interpreted; also economical and possible of completion in as short a time as consistent with accuracy.

(1) The granular and barred types of bacilli give the highest percentage of positive tests. In clinical diphtheria they are almost invariably virulent for guinea pigs. No matter how long they persist in the throat after recovery they should be regarded as dangerous until proved otherwise. Of all types they are most likely to retain their virulence.

(2) The value of animal inoculation tests is especially appreciable when dealing with solid types of bacilli. The longer types are more likely to retain virulence than the shorter varieties. Both, however, may be descendants of the "carrier" bacillus rather than of the bacillus producing the clinical evidences of the disease.

(3) The short solid types of bacilli are especially common in the nose in the absence of clinical diphtheria. In a small percentage of cases these bacilli may be truly pathogenic, but the majority of cultures are found without virulence when tested by animal inoculation.

(4) The long solid types of bacilli, so frequently found in otitis media, are in the majority of cases non-virulent.

(5) Animal inoculation tests have a special field of usefulness in testing the solid types for virulence when they persist in the tissues over a long period of time or when found in contact with "carrier" cases.

(6) Cultures of the short solid D_2 types have proven non-virulent with so much regularity that whenever we are sure that the type is true we do not hesitate to report negatively upon the culture and release quarantine. Although this method has been in practice for several years and concerned the discharge of hundreds of cases, no return cases can be attributed to the presence of these bacilli in throats or noses of their hosts.

The majority of the cultures tested by us were from patients who had been in the hospital from fifteen to twenty-three days, and after the disappearance of clinical evidences of the disease. A few cultures were tested in the first week of the disease, especially when the clinical evidences of diphtheria were slight or atypical.

Practical Value of Virulence Tests—In the handling of diphtheria, second only in importance to the prompt, vigorous and specific treatment of the disease itself, is the determination of the time when the individual ceases to possess the power of infecting others. This applies to "carriers" as well as to convalescents from clinical diphtheria.

As already stated, virulence tests may serve a very useful function in differentiating between virulent and non-virulent diphtheria bacilli when the micro-organisms persist for long periods of time on the mucous membranes or in persons who carry these bacilli, either after or without contact with a clinical case of diphtheria.

For the proper management of diphtheria, according to bacteriologic examinations, an effort must be made to differentiate between the harmful and harmless bacilli. For instance, a "carrier" may be quarantined forever if guided by the fact that the presence of a diphtheria-like bacillus means diphtheria. The medical attendant must be convinced of the value of bacteriologic examinations and of the earnest efforts of the bacteriologist to work with him, both in the interests of his patient and for the public welfare. The practitioner must be taught not to be afraid to report all of his cases and to culture faithfully. If, however, bacteriologic examinations serve to give unnecessary embarrassment to the practitioner by quarantining "carrier" cases, or by maintaining a quarantine unnecessarily long after convalescence as a result of conscientious efforts on the part of the latter to do his duty in taking cultures, he is not likely to give his best co-operation, and without this no real good is possible.

Conclusions—

(1) Animal inoculation tests have been found of great value in determining the virulence of diphtheria bacilli.

(2) Virulence tests are the only practical and safe means of determining the possible harmfulness of diphtheria bacilli.

(3) Virulence tests have been found especially useful in the management of diphtheria bacillus "carriers," especially from the standpoint of duration of quarantine. This applies to healthy "carriers" discovered as the result of culture; to convalescents and persons showing atypical or slight clinical evidences of infection of the throat, nose, eye, wounds, etc., with cultures showing the presence of diphtheria bacilli.

(4) Virulence tests in order to be practical and reliable must be sufficiently delicate to detect low degrees of virulence, and this constitutes the first and most important essential; it is desirable to conduct the test as economically and as speedily as consistent with specificity and delicacy.

(5) Subcutaneous injections of 250-300 grams in guinea pigs with cultures was found to yield better results than intracutaneous and intraperitoneal injections. The subcutaneous injection of 4 c.c. of a good 24 hours culture of diphtheria bacilli on a tube of Loeffler's media washed off with 10 c.c. of normal salt solution was found to yield as delicate and specific results as any method, besides being a test requiring a short space of time for its conduct.

A second method yielding excellent results, but requiring more time, consists in cultivating the bacilli in serum dextrose broth for 72 hours, and injecting 250-300 gram pigs subcutaneously with 1.3 to 1.5 c.c. of unfiltered culture.

(6) Vocal edema and even slight evidences of toxemia of the test animal, with abscence of these signs in the control, are regarded as indicating virulence, even though the animal does not succumb in the four-day period of observation.

(7) Granular types of diphtheria bacilli were found virulent in about 70 per cent. of cultures from the throat, nose and ear; barred bacilli were found of equal virulence with the granular types. Long, solid bacilli were found virulent in about 42 per cent. of cultures; cultures of short, solid bacilli were found uniformly to possess no virulence.

(8) Virulence tests were found of most value in determining the potential harmfulness of the solid varieties of diphtheria bacilli because these types are especially likely to be found in carriers.

DEPARTMENT OF ABSTRACTS

Original Condensations of Current Pediatric Literature by the Editors and the Following Associates

T. Wood Clarke	Utica, N. Y.	Raymond B. Mixsell	Pasadena, Cal.
Coleman W. Cutler	New York City	Rudolph D. Moffett	New York City
Charles E. Farr	New York City	Willard S. Parker	Boston, Mass.
Morris Friedson	New York City	Mark S. Reuben	New York City
Gaylord W. Graves	New York City	Mills Sturtevant	New York City
Jerome S. Leopold	New York City	Samuel W. Thurber	New York City
William Lyon	Jackson, Mich.	Eugene F. Warner	St. Paul, Minn.
Stafford McLean	New York City	Edwin T. Wyman	Boston, Mass.
Carlo D. Martinetti	Orange, N. J.	J. Herbert Young	Newton, Mass.

Jamison, S. Chaile: The Chemical Interpretation of the Serum Tests for Typhoid Fever and Syphilis. (The New Orleans Medical and Surgical Journal, October, 1915.)

The author, in describing his experiences from a laboratory viewpoint of several hundred reactions, believes the agglutination reaction is usually distinctly positive between the twelfth and fifteenth day of the disease. He finds it positive even years after a typhoid infection or a vaccination, but usually not longer than eighteen months. The absence of a positive reaction does not mean that a patient is not immune to typhoid infection. If a patient have a negative Widal and subsequently a positive it is conclusive evidence of a typhoid infection. Agglutinations occurring in dilutions of less than 1-100 should be disregarded. It is especially true if dried blood is used.

In regard to the Wassermann reaction, he states a positive reaction is not to be expected during the first stage, as a rule; the reaction does not become positive until five days before the eruption on the skin, although a positive eruption has occurred five days after infection. In all cases of untreated secondary syphilis the serum reaction should be positive and if negative it is a very strong piece of evidence that the infection is non-specific.

In tertiary syphilis the reaction is positive in only 40 per cent. of cases. This is probably because most of the cases have received more or less thorough treatment. The negro who neglects treatment gives a high percentage of positive reaction in the tertiary stage. In tabes, 50 per cent. are positive. In paresis it should be higher; in fact, the writer thinks it should reach 90 per cent. In cerebrospinal syphilis, 75 per cent. In congenital syphilis the reaction should always be positive. The author believes the diagnosis of syphilis based on the Wassermann reaction alone is open to criticism. No case should be considered cured until the Wassermann reaction has been negative at six-months intervals for two years.

SCHLEISSNER, FELIX: THE ETIOLOGY OF SCARLET FEVER. (Jahrb. für Kinderhk., September, 1915, p. 225.)

A twenty-four-hour bouillon culture of streptococci from scarlet fever patients was blown into the mouth and nose of the Macacus Rhesus. Twelve monkeys out of 27 became infected. The infection was characterized by fever, sore throat, an enanthem, strawberry tongue, and a lamellar desquamation ten to twelve days after the sore throat had appeared. All of the infected animals lived. The infection was also transmitted from monkey to monkey by transferring the secretion from the mouth. Attempts to cause re-infection were negative, so that there appears to have resulted an immunity in the infected animals. Experiments in which the filtrate from the bouillon culture was used were all negative. These results make it seem very plausible that the streptococci found in scarlet fever are really the cause of this disease. J. S. L.

PHILLIPS, JOHN: REPORT OF CASES OF HEMORRHAGIC CONDITIONS IN INFANTS. (Cleveland Medical Journal, August, 1915, p. 533.)

The author reports 3 cases of intracranial hemorrhage, 2 of which were operated but did not recover. One case was in such a serious condition that operation was not advised. Only 1 case out of the 3 had bulging fontanel; 1 case had general convulsions, and the other 2 showed localized paralysis and twitching in the arms and legs. In 1 case there was hemorrhage from the bowel and into the scrotum and penis. Labor was easy in all 3, low forceps being used in only 1. The most interesting feature of these cases was the late appearance of symptoms. This would suggest that the hemorrhage was not due to trauma at birth, but that its occurrence was coincident with the appearance of symptoms. Operation should be attempted in all cases, because if the child survives and the clot is not removed mental or physical defects will result.

Another case of hemorrhage due to syphilis in a baby eleven weeks old is described. Hemorrhage from the oral and nasal mucous membranes was present and all signs of congenital syphilis were found. The leukocytes numbered 77,000. Two cases of simple hemorrhage of the newborn are also described. Horse serum in doses of 15 c.c. frequently repeated resulted in recovery in both cases. Injections either of horse serum or whole blood drawn from a vein of the mother are usually efficacious. Some cases that do not respond to these measures are cured by direct transfusion of blood. The condition is due either to a deficiency of, or absence of, thrombin or fibrinogen or to a localized vascular defect. E. F. W.

JEANNERT, LUCIEN: POSTURAL ALBUMINURIA IN CHILDHOOD. (Archiv. de Méd. des Enfants, September, 1915, Vol. XVIII., No. 9, pp. 461-489.)

After reviewing the literature on the subject, beginning with Stirling in 1887, the author described the views of the two schools After many names had been given to this condition, including transitory, intermittent, orthostatic and finally lordotic, Jehle, who in 1909 proposed the term lordotic, in 1914 modified his views by suggesting the term orthostatic-lordotic albuminuria. In passing, we might mention the timely hint by Trousseau against the tendency of changing the name of a disease according to the theories of the moment. The writer holds to the term postural albuminuria, because it indicates the general character of the disease without presupposing the cause. While this work by Jehle has demonstrated beyond a doubt the existence of a relationship between lordosis and postural albuminuria, it is no less true that Langstein and others refute this and consider orthostatism the cause. Weith and Scholder, who have recently examined a large number of pupils in the schools of Laussanne, agree entirely with Jehle. However, the marked disproportion between the albuminuria caused while standing (37 per cent.) and while sitting (14 per cent.) speaks also in favor of orthostatism. They failed to control their results by studies in lordosis when lying down. The author believes that neither explanation is entirely satisfactory.

Several preliminary remarks by the author make Jehle's views seem too positive.

(1) Many children with fixed lordosis never showed albuminuria.

(2) Numerous cases of spondylitis did not show albumin, in spite of severe compensatory lordosis.

(3) In trying Jehle's test (Prolonged maximum lordosis) upon all the patients in the Children's Hospital in Basle, albumin practically was never found.

It was found that the third factor, existing especially at school where intermittent albuminuria was found in 20 per cent. of the pupils, was immobility.

The following tests were made:—

(1) In bed and on a milk diet; albumin, 0.

(2) In bed and on a mixed diet; albumin, 0.

(3) Artificial maximum lordosis in a reclining position

½ hour	albumin,	0
1 hour	“	0
2 hours	“	0
3 hours	“	0

(4) Up and playing in the yard.. “ 0

(5) Lordosis actively maintained in orthostatic position with immobility

2 minutes	albumin,	0
3 minutes	“	1 per 1,000
5 minutes	“	2 “ “
10 minutes	“	1½ “ “
15 minutes	“	3 “ “
30 minutes	“	10 “ “

(6) Lordosis as in test No. 5, with successive movements of the legs, 2 minutes up to 30 minutes, albumin, 0.

Thus the position of a scholar, slightly lordotic, combined with muscular immobility, was the unique cause of the albuminuria, being found in 49 per cent. of the children examined.

Adding that of the 204 children studied, 2 per cent. had a true lordosis and the principal results of this study will have been pointed out. The influence of sex and age played no part, and the condition of the blood pressure showed no appreciable differences. Tuberculosis, adenoids, anemia, etc., had no part in the results.

Albuminuria consists of an intermittent elimination of albumin produced:—

(1) Exceptionally under the influence of lordosis alone.

(2) Exceptionally under the influence of orthostatism alone.

(3) Regularly when the three factors exist together—lordosis (true or momentary), orthostatism and immobility.

The theory of the mechanical cause is probably a venous stasis in the renal territory.

The differential diagnosis should not be difficult from the albuminuria of fatigue, cyclic alimentary albuminuria, hereditary albuminuria, the albuminuria of the newborn, and the intermittent, febrile albuminuria of tuberculosis.

The prognosis is excellent.

The treatment is simple, stopping school for a few weeks, or months, sending to the mountains, tonics such as iron, arsenic and phosphorus, and, in the severe cases, massage and exercise, such as walking on hands and feet. H. K. H.

COMBY, M. J.: TREATMENT OF TETANUS BY SUBCUTANEOUS INJECTIONS OF ANTITETANIC SERUM. (Archiv. de Méd. des Infants, July, 1915, No. 7.)

While all surgeons agree that antitetanic serum should be given as a preventive measure, as soon as possible, after all suspicious cuts or other injuries, there is still difference of opinion as to its curative value. Comby reviewed the lateratur, including the reports of successful treatment by Chauffard and Quénn, L'Ombrédenne, Wm. F. Gibb, Letoux and others who injected the serum directly into the brain; by Peruzzi and others, who injected the serum into the spinal canal, and by J. Galletty, Murray, Letoux, V. Barachini, Sidney H. Long, L. Martin, B. Darré and G. Menabuoni, H. Beatest and B. A. Thomas, Montagnon and J. Renault, with subcutaneous injections; and by J. MacCaw, L. Morquio and W. Winslow Hall, in tetanus in the newborn, by subcutaneous injections, making in all 24 cases.

The writer reports 4 cases of his own, resulting in recovery, in which the incubation periods were twelve, eighteen, nineteen and twenty days. He believes that cases of tetanus which develop rapidly after the wound are more virulent than those which appear after a longer interval. In a case on his service of a girl thirteen years old, reported by Broca, following a rubbed spot due to the compression of a brace to correct a scoliosis, the incubation period was very short and the child died in less than forty-eight hours in spite of subcutaneous injections.

Of his cases, the first was a boy eleven years old, who was given 40 c.c. of the serum from the Pasteur Institute, Paris, subcutaneously, and 20 c.c. four times a day for seven days. Eight days after the last injection there was a rise in temperature and an urticarial eruption which serum disease lasted for three days. In the second case, a boy of thirteen years was given 10 c.c. subcutaneously for four days. In the third case, a boy of twelve years was given 40 c.c. in one large dose with erythema seven days later. The fourth case, also a boy, ten years old, received 20 c.c. for four days, with serum urticaria a week later. These cases bear out Comby's belief that a very virulent case, with an incubation period of a week at the most, is almost always fatal. no matter what treatment. If less virulent, it will have a longer incubation, up to the end of the third week and will be cured by rational treatment, including bromides, chloral, carbolic injections and antitetanic serum. These clinical findings agree with the results reported by Ch. Walther on September 29, 1914, on the cause and prophylaxis of tetanus among those wounded in the war. H. K. H.

PORTERFIELD, ELMO P.: AUTOSEROTHERAPY. (The Medical Fortnightly and Laboratory News, September 15, 1915, p. 247.)

The first use of human serum was in pregnant women suffering from toxemia, eclampsia and hyperemesis. The serum used was taken from a healthy pregnant woman. Later on the serum from the patient was used for various skin manifestations such as psoriasis, pruritis, urticaria, Dermatitis herpetiformis and pemphigus. The results were quite encouraging. The author's own work along these lines was prompted by the results he had obtained in several cases of pleurisy with effusion, in which a part of the serum exudate was withdrawn and immediately 2 c.c. injected subcutaneously, once daily for three days. All of these cases proved negative for tuberculosis by inoculation in guinea pigs. The results were alike in all followers of this treatment, prompt absorption of the remaining exudate, and in none of the author's cases did it reform.

The author's method of obtaining and using blood serum is as follows: Ten c.c. of blood is withdrawn from the arm into a sterile test tube and immediately defibrinated, then centrifuged, and without filtering placed on ice for twenty-four hours, after which it is filtered through gauze. It is then ready for subcutaneous injection.

In 5 cases of seborrheic eczema which had resisted all forms of treatment there was a complete disappearance of the skin lesions under serum treatment. The skin appeared normal within five days, and aften ten days to two weeks the itching entirely ceased. In 3 cases of psoriasis the serum combined with a local application of chrysarobin (Fox) was followed by an entire disappearance of the lesions. Of the 3 cases of psoriasis the one on the scalp cleared up in three days—the other two within ten days. In a case of syphilis that developed an eruption after three doses of salvarsan, an injection of 20 c.c. of the patient's own serum was given and the eruption disappeared within five days. The author attributes the action of the serum to an increase in the formation of antibodies in sufficient strength to bring about an immunity. Especially does this theory seem plausible in the treatment of exudative skin lesions. He also thinks that the serum element of salvarsanized serum is the important constituent of this agency. He suggests the serum alone be tried prior to the injection of salvarsanized serum. E. F. W.

CRANE, CLAUDE G.: BACTERIAL VACCINES IN EAR, NOSE AND THROAT INFECTIONS. (Long Island Medical Journal, October 1915, pp. 419-425.)

The author emphasizes the fact that focal infections are closely related to systemic diseases. The first detail is the determination of the character of the infection; several cultures may have to be made before a complete diagnosis results. Growths of staphylococcus often obscure the streptococcus, and this holds good in other organisms. In acute infection it is well to secure the cultures at the onset of the condition. Cultures made when the ear drum is incised will be more potent than one taken twenty-four hours later. No time should intervene before beginning incubation. Repeated cultures are necessary to meet the frequent changing type of organism. The author believes that failure to secure constant results is entirely due to faulty technic or to a culture representing the infection. He cites a number of cases with excellent results in middle ear infections with and without mastoid involvement, hay fever and asthma, arthritis, acute and chronic sinus infection, etc. He advocates the use of vaccine as a help, but urges surgical and medical treatment to be used in conjunction. S. McL.

HUTINEL, V.: MALIGNANT SCARLET FEVER. (The Medical Press, August 23, 1915, pp. 166-167.)

The author comments on the great value of adrenalin in such cases. In the years 1912-1913, of 417 children with scarlet 34 had malignant types, and of these, 9 cases died; whereas in 1910-1911 37 died out of 833. Thos shows a reduction in mortality of over 50 per cent. The author differentiates the malignant type from ordinary scarlet: first, by eruption, which is of a purplish or livid hue; second, by an accompanying erythema, which may make its appearance at the onset, when the eruption is fully developed, or when it is fading. It appears on knees, elbows, buttocks, and more rarely on the face, and is made up of patches which are separated by white areas. This superadded eruption often outlasts the scarlatiniform rash.

Advance watching for a vasomotor phenomenon known as Sargent's white line, this is elected by gently running nail over lower part of abdomen and broad white line is seen. This is presumptive evidence of changes in the suprarenal gland but author doubts this. The end of the attack is often characterized by pigmentation similar to Addison's disease; this he is convinced indicates changes in adrenals but might also be due to functional disturbance of solar plexus such as is seen in tubercular enteritis and peritonitis. He has seen four such manifestations in malignant scarlet.

Frequently meningeal symptoms are noted: author offers suggestion that erythematous eruption may involve meninges.

In malignant scarlet there is a distinct drop in B. P., falling sometimes as low as 50.

Frequency of the pulse was often noted by the ancients and they marked the ill effects of bleeding in such cases.

The liver is a manometer to the state of intravenous tension; it frequently becomes large from congestion.

Abdominal tenderness is a common condition and it may be mistaken for a complicating appendicitis; the tenderness is high up on a line with tenth rib.

Toxic polypnoea is frequent. Urine contains acetone and diacetic acid, the breath has the acetone odor. Fugitive albuminuria is present in these cases that subsequently develop nephritis.

There are some complications which are really part of the disease, ulcero-necrotic angina, serpiginous ulcers of the tongue and throat, fissure ulcers, at the labial commissures, purulent rhinitis, suppurative otitis, voluminous masses of enlarged glands especially on the children of syphilitic parents.

More rarely we meet purpura, epistaxis, renal or intestinal hemorrhage.

Death may intervene before the appearance of the eruption or a few days later. It is generally preceded by intense prostration, fall of blood pressure, smallness of the pulse, etc. S. McL.

SCHORER, EDWIN HENRY: CONGENITAL HEART LESIONS IN INFANCY AND CHILDHOOD. (The Journal of the Missouri State Medical Association, September, 1915, p. 399.)

Congenital heart lesions are dealt with in this paper under the following heads:

1. Developmental causes of anatomical heart defects.
2. Relative frequency of occurrence of the various anomalies.
3. Diagnosis of the particular anomalies.
4. Symptoms and signs of the various anomalies.
5. Prognosis in the various defects.

A brief anatomical description of the development of the heart is given. The various anomalies are explained under eight subheads. The frequency of occurrence is shown in a table taken from Holt. This gives the results found in 242 autopsies. According to this table only 23 out of the entire number showed a single heart lesion. The majority of the lesions were rightsided.

The more common signs and symptoms of congenital heart lesions are the presence of systolic murmurs, enlargement to the right, clubbing of the fingers and toes if the child lives long enough, cyanosis (this may be absent, or when present may not be associated with a congenital heart lesion) and polycythemia when there is cyanosis. As the defects are usually multiple, absolute diagnosis is not always possible. A systolic murmur transmitted to the larger vessels of the neck is usually regarded as being a sign of stenosis of the aorta, but as the left side of the heart is seldom involved such a murmur is usually associated with patent ductus arteriosus. The continous or humming-top murmur is diagnostic of patent ductus arteriosus. A thrill at the apex is usually heard in pulmonary stenosis or atresia. Cyanosis is probably always a sign diagnostic of pulmonary stenosis and atresia and is accompanied by polycythemia.

The prognosis of the different forms is as follows:

Patent foramen ovale usually has little or no effect and in many cases is not diagnosed.

Deficient intraventricular septum is not incompatible with life.

Patent ductus arteriosus generally offers a good prognosis.

Pulmonary stenosis and atresia usually terminate fatally, and unless there is the compensating defect of a deficient intraventricular septum or of a patent ductus arteriosus, death occurs very early in life. Even when compensating lesions exist, death usually occurs before the tenth year of life, and the child suffers much agony and pain.

Patent foramen ovale is not the important or even frequent congenital heart lesion. Diagnosis of congenital heart lesions is important immediately, and later on when acquired defects may occur should be differentiated. E. F. W.

DUNCAN, CHARLES H.: A POSITIVE METHOD OF PREVENTING AND CURING PURULENT INFECTION. (American Medicine, October, 1915, pp. 772-774.)

The author desires to disseminate a knowledge of a simple method of wound treatment which is being used to a degree by the nations at war and which is applicable to all infections. The reaction of the unmodified toxins contained in the live microorganisms found in the wounds is the specific curative reaction to the same toxins remaining in the body. He states that the method is not in the experimental stage, but has been used extensively. The individual should be instructed to lick the wound as soon as received and thereafter every two to four hours for several days. This will prevent the formation of pus and the wound will heal by first intention. If the wound cannot be reached by the patient's mouth the same effect is produced by his chewing for five minutes twice daily the dressings. The last mentioned can be done by putting the stained portion of the gauze in 4 ounces of sterile water and, shaking this, the patient swallows. After the appearance of pus in a wound the patient is given by mouth two drops of the purulent exudate every hour for three doses. This may be modified by dilution with sterile water. Wounds of the nose, mouth, esophagus, lungs, etc., are treated by the injection of small amounts of the exudate mixed with water after their filtration through a Berkefeld filter. Frequently one injection will cure. This the author terms autoimmunization. S. McL.

LISSER, HANS: THE TREATMENT OF CONGENITAL SYPHILIS. (California State Journal of Medicine, December, 1915, p. 469.)

In an exhaustive article Lisser reviews the specific treatment of congenital syphilis and advises the following method of treatment: In the first few years of life, mercurial baths or inunctions, with intravenous neosalvarsan solutions by the veins of the scalp. From two to eight years of life, mercurial baths or inunctions, with epifascial injections of neosalvarsan. From eight to fifteen years of age, whenever possible, mercurial intramuscular injections, with intravenous old salvarsan, using the veins of the forearm; otherwise neosalvarsan epifascially. The iodides are to be used at all ages, in all forms of the disease.

Prophylactic treatment is strongly advocated and consists of thorough treatment of syphilitic patients before marriage; preventing conception in syphilitic individuals who are already married, during that period of the disease when transmission to the offspring is most liable to occur; and thorough treatment of the pregnant mother before the birth of the child.

The delicacy of the tissues in children absolutely prohibit the intramuscular use of old salvarsan. The intravenous method by way of the veins of the scalp or the jugular vein may be employed, but old salvarsan must be diluted up to 50 or 100 c.c., and it is difficult to keep the child quiet enough for a sufficiently long period of time to permit the flow of such amounts of fluid. Great caution is necessary in the dosage; a safe average dose would be 0.01 gram to ever kilo of weight.

Neosalvarsan has a wider field of usefulness in congenital syphilis and the method of choice in administration in infants up to about two years of age is the intravenous injection of the veins of the scalp. The author quotes the technic of Wechselmann for the epifascial injection of neosalvarsan as follows: First, the needle is inserted into a point over the fascia in the gluteal region and the point of the needle moved in a pendulum manner back and forth. If the point of the needle is just over the fascia a scratchy, grating sensation, sometimes audible, usually palpable, is transmitted to the needle as the point scrapes over the fascia. This is hard to obtain because of the delicacy of the tissues. Second, a rotary twist is given the needle along its perpendicular axis in order ta be certain that it is quite free and not entangled in a nerve blood vessel or connective tissue bundle. It should be quite freely movable. Third, 1 c.c. of sterile salt solution in a Record or Luer syringe is injected. Only the lightest pressure is required to force the fluid in. Fourth, the springe is removed and the salt solution should immediately regurgitate through the needle, indicating that it is next to the fascia. If all these conditions are fulfilled the neosalvarsan is then injected. As high concentrations as 100 per cent. may be used.

Mercury should always be combined with the use of neosalvarsan. The intramuscular injections are contraindicated in infancy and childhood so that the other methods of administration remain, inunctions, by mouth and the use of mercurial baths. This latter is the most satisfactory method for infants and young children. A wooden washtub is employed filled with warm water, to which 20 or 30 grains of bichloride of mercury with an equal amount of ammonium chloride has been added. The child should remain in the bath ten to fifteen minutes and such baths should be given every day or every other day.

Lisser gives the dictum that a definitely positive Wassermann reaction means syphilis invariably, and a negative reaction means nothing. He closes with a plea to have all cases of congenital syphilis placed in the charge of the internist. R. B. M.

DUPAQUIER, E. M.: REPORT ON INTRAVENOUS INJECTION OF DIPHTHERIA ANTITOXIN. (New Orleans Medical and Surgical Journal, September, 1915, pp. 145-150.)

The author advocates stronger intravenous route, which for a time was routine method at the Charity Hospital, New Orleans.

This routine was abandoned, to his regret, because of the death of an eight-year-old female child three hours after injection, intravenously, of 10,000 units. The writer strongly urges the routine rise of the intravenous route: (1) Because of its painlessness, (2) rapidity of absorption, (3) early fall of temperature, (4) quick disappearance of membranes, (5) quick cessation of distressive symptoms, (6) earlier disappearance of Klebs-Loeffler from throat, (7) reduction of number of carriers, and (8) saving in serum.

The writer advocates the use of serum of greater dilution. This he thinks will minimize the dangers of serum reaction, the solution a dilution of dry globulins, if possible, and not cloudy. It must be heated to body temperature and should not be administered directly upon the admission of the patient to the hospital, but after the lapse of an hour, when the patient has recovered from the fatigue of the transfer. The gravity method should be used instead of the pressure method. The writer believes this method will come more generally into vogue when the technic is entirely mastered and made free from dangerous results. S. McL.

HUTINEL, V.: THE DIAGNOSIS OF LOBAR PNEUMONIA IN CHILDREN. (Medical Press and Circular, July 7, 1915, pp. 6-8.)

The author urges the necessity of differentiation between bronchial and lobar types, comments on frequency of former in first twelve months of life and remarks that after the third year it is almost always secondary to infectious disease. He recognizes a type of a three-day pneumonia of the abortive group, which he regards seriously and thinks they later present unmistakable signs of tuberculosis. In discussing the complication, the author urges the use of the radioscope to determine the location of the fluid and comments on the difficulty of determining pressure of interlobular fluid without the X-ray. He believes lobar pneumonia almost always benign in children and considers the complications due to the pneumococcus as of a more benign type than when occurring primarily with the same type of organism. In discussing the types of complication and their severity, he remarks that meningeal pneumococcia rarely terminates in suppuration. S. McL.

TERRY, B. F.: SOME EXPERIENCES WITH DR. KARL VON RUCK'S WATERY EXTRACT OF TUBERCLE BACILLI AND VACCINE FOR TUBERCULOSIS. (New Orleans Medical and Surgical Journal, August, 1915, pp. 81-90.)

The author has used this form of treatment in pulmonary tuberculosis, infantile marasmus, tuberculous rheumatism and in hemorrhagic conditions. In all, over 82 cases in both early and advanced types were treated with the extract and 478 with the vaccine; both methods, according to the writer, yielded excellent results. The writer does not state if diagnosis of tuberculosis was controlled by tuberculin skin reaction or sputum findings, so the abstractor assumes no such control was made.

The author states in his article his belief that all chronic rheumatism depends upon an underlying tuberculosis, and with this object in mind he successfully treated a number of patients with the watery extract. In hemorrhagic conditions he assumed a latent or occult tuberculosis, and again used the watery extract, as he expressed it: ("My results invariably justified my faith.") In citing one particular case of a lumbago in a farm boy, he states: "One could easily see that he had a latent tuberculosis."

The abstractor offers his apologies for digesting the above. If one cannot admire the intelligence of the author, one can at least envy his faith. S. McL.

GRULEE, CLIFFORD G.: SPASMOPHILIC CONVULSIONS IN INFANCY: THEIR DIFFERENTIATION AND TREATMENT. (Journal of the Michigan State Medical Society, November, 1915, p. 555.)

Spasmophilic convulsions are differentiated from the several forms of convulsions met with in infancy. Epilepsy, meningitis and the symptomatic types are carefully described. Besides the cardinal signs of spasmophilia there are a few other general points of differentiation. Namely that spasmophilic convulsions are nearly always general in type and are frequently repeated within a short interval of time. Localized spasm sometimes accompanying spasmophilia are laryngeal stridor, tetany, rotary head spasm, etc. The subject of electrical irritability, including the method of eliciting the different reactions, is well described. In differentiating epilepsy from spasmophilia the point is emphasized that there is no increase of electrical irritability in epilepsy.

The author reviews the causes underlying spasmophilia, and in this connection states that a disturbance of parathyroid secretion, as well as a distinct increase of calcium excretion, has been definitely proved. The association of rickets with spasmophilia, as well as poor hygienic surroundings and respiratory defects accompanying this condition, are dwelt upon.

Treatment consists in the immediate control of the convulsions with chloroform or morphin, grain 1-50 to 1-100, and then followed by chloral hydrate per rectum in doses of 2 to 5 grains every four hours for twenty-four to forty-eight hours. Calcium lactate, 10 to 15 grains every two hours is well borne and demonstrates its efficacy in a decreased electrical irritability. Four to ten c.c. of an 8 per cent. anhydrous magnesium sulphate solution injected subcutaneously may be used once a day for two or three days. Dietetic treatment consists in the use of carbohydrates and curds without the whey for three or four days, when the whey can be added gradually to the formula. The author is convinced that this measure has demonstrated its usefulness, since he first proved that the whey of milk was the irritating element. Cod liver oil and phosphorus should be employed over a long period to prevent excessive calcium loss. All external stimuli liable to disturb the child should be avoided. The use of alkalies is likewise contraindicated, as they increase the electrical irritability. E. F. W.

FITZSIMMONS, H. J.: FOUR CASES OF THE UNILATERAL ROTARY DISPLACEMENT OF THE CERVICAL SPINE. (Interstate Medical Journal, October, 1915, p. 983.)

Unilateral rotary displacements between the atlas and the axis may be divided into two classes—those with, and those without sufficient displacement to give cord symptoms. The diagnosis of the first class is generally made. In those without cord symptoms, a class which is much more frequent, a diagnosis is not correctly made often enough. By unilateral displacement of the atlas on the axis is meant displacement of the inferior articular process on one side of the atlas from the corresponding superior process of the axis. Relaxed muscles on the side toward which the twist exists should at once raise the question of cervical dislocation. The 4 cases reported are in children eleven, eight and six years of age. These cases illustrate a symptom-complex from which a diagnosis of this type of "twisted neck" can be made: (1) Inability to rotate the head without tilting the chin on the side affected. (2) Prominence of the transverse process of the axis on the side affected. (3) The presence of occipital pain to any degree. (4) The absence of muscle contractions which could explain the deformity and restriction of rotation. (5) Absence of nerve lesions. (6) Radiographic confirmation of cervical displacement. Reduction is obtained by extending the head diagonally in the direction between the backward line and the lateral line on the side of the convexity, the lateral process and the lamina of the vertebrae furnish a fulcrum by means of which the misplaced articular process is readily lifted. A slight rotary movement completes the reduction.

J. H. Y.

SIMPSON, S., AND HILL, R. L.: THE EFFECT OF REPEATED INJECTIONS OF PITUITRIN ON MILK SECRETION. (American Journal of Physiology, February, 1915, p. 347.)

The administration of pituitary extract, by intravenous, intramuscular or subcutaneous injection, to a lactating animal leads to an immediate increase in the amount of milk secreted and also in its fat content. It is found, however, that there is a diminution in the yield at the next milking period so that for the twenty-four hours the total quantity of milk or cream is not increased. In the goat, if the injection be continued at intervals over a prolonged period—several months—immunity to its action on the mammary gland appears to be established both in regard to the amount of milk yielded and the percentage of fat it contains.

J. H. Y.

DUNN, C. H., AND HAMMOND, J.: A CASE OF FRIEDLANDER'S PNEUMONIA WITH RECOVERY. (Interstate Medical Journal, November, 1915, p. 1,133.)

The authors report a case of Friedlander's pneumonia in a boy fourteen and a half months old. The case clinically presented the features of a lobar pneumonia, first of the left lower lobe with crisis, and then a reinfection in the left upper lobe. Thoracentesis was performed but no fluid was obtained, the needle entering the lung. From a small amount of fibrinous material found in the lumen of the needle a pure culture of the bacillus mucosus capsulatus was grown. This result was confirmed by a second tapping. This is, as far as known, the only case on record of recovery from Friedlander's pneumonia, and also the first case of Friedlander's pneumonia in an infant to be recorded. J. H. Y.

EHRENFEST, H.: THE PHYSIOLOGY OF LACTATION. (Interstate Medical Journal, November, 1915, p. 1,146.)

Ehrenfest reviews the recent literature on the physiology of lactation. All recent observations and investigations conclude that neither mechanical nor nervous causes offer an acceptable explanation for the establishment of the normal secretory functions of the breasts subsequent to the expulsion of the fetus. This function must be explained by the production of specific hormones. The three possible sources of such hormones are the ovary, the ovum (fetus and placenta) and the mamma itself. He concludes that the physiological secretory activity of the mammary glands in form of lactation must be preceded by typical hyperplastic changes most pronounced in the acini. The specific growth hormone is, most likely, provided by the corpus luteum. A substance stimulating breast development is also produced in the placenta, but it seems possible that this hormone is identical with a hormone produced in the corpus luteum. It seems more likely that the beginning of the secretory activity of the hyperplastic mammary glands is the result of a direct stimulation, than the result of the cessation in activity of special inhibiting hormones formed either in the ovary or placenta. The secretory stimulation of the activated breast glands is not necessarily specific. While in this respect the placenta possibly plays an important rôle, all lymphagogue substances, indeed all processes which stimulate lymph cell production, may prove effective galactagogues. J. H. Y.

HEINEMAN, P. G.: THE GERMICIDAL EFFECT OF LACTIC ACID IN MILK. (Journal of Infectious Diseases, May, 1915, p. 479.)

From a study of the effect of sterilized mixtures of milk and lactic acid on pathogenic bacteria, Heineman reaches the following conclusions. Some acid-tolerant cells of bacilli coli may survive the presence of 0.6 per cent. lactic acid in milk. Bacilli dysenteriæ, bacilli typhosus, bacilli diphtheriæ, bacilli paratyphosus and spirillum cholera in these experiments were destroyed by the presence of 0.45 per cent. lactic acid. It is possible that strains of these bacteria exist which are able to resist a greater amount of the lactic acid.

Acid-tolerant strains of bacilli coli, bacilli dysenteriæ, bacilli typhosus, and bacilli paratyphosus may multiply in the presence of quantities of lactic acid, which are destructive to the majority of cells. The smaller the initial amount of lactic acid, the more likely is the growth of acid-tolerant strains. Consequently, the slower milk sours, the greater is the danger of pathogenic bacteria surviving.

The growth of the test bacteria is influenced to a marked degree by the amount of acid present. Up to a fairly definite amount of acid there is an increase in the numbers, followed by a decrease, which becomes more pronounced as the amount of acid increases. The amount of acid may increase after the number of bacteria has commenced to decrease owing to the liberation of enzymes.

Acids other than lactic acid are frequently present in buttermilk. Buttermilk, therefore, should be looked upon with suspicion, especially if heavily polluted, unless prepared from pasteurized milk. Still the chances of buttermilk becoming a carrier of infection are much smaller than of raw sweet milk. The presence of saprophytic bacteria in buttermilk may have some influence on pathogenic bacteria. Whether this influence is favorable or otherwise is difficult to determine by present bacteriologic methods. J. H. Y.

CLARK, W. M.: THE REACTION OF COW'S MILK MODIFIED FOR INFANT FEEDING. (Journal of Medical Research, January, 1915, p. 431.)

Clark states that the true reaction of milk can only be defined in terms of hydrogen- or hydroxyl-ion concentration. The addition of alkalies to modified milk for the purpose of neutralizing "the high acidity of cow's milk" is shown to be a practice based upon wrong principles. The addition of alkalies to modified milk for the purpose of preventing firm clots in the infant stomach is shown to be a procedure which not only may be unnecessary, but one which involves a possible inhibition of both gastric proteolysis and lipolysis. Finally, the addition of alkalies to modified milk is criticized because of its probable influence in displacing from the intestine a normal bacterial fermentation and replacing it with those proteolytic or putrefactive processes which are responsible for many of the digestive disorders of infancy. J. H. Y.

Waldron, C. W.: Roentgenology of the Accessory Nasal Sinuses with Special Reference to Sinusitis in Children. (Interstate Medical Journal, October, 1915, p. 1,031.)

Waldron emphasizes the importance of the roentgenogram in the diagnosis and treatment of sinusitis in children. He believes this condition is relatively frequent in the young and is very often undiagnosed. A study of specimens makes one realize more fully the probable incidence of sinusitis in children and the difficulties of regional diagnosis by intranasal examination. Children with a persistent nasal discharge or expectoration following a severe cold, with or without frontal headache, demand a roentgenogram of the accessory nasal sinuses. J. H. Y.

Lane, J. E.: The Prevention and Treatment of Ringworm and Favus of the Scalp. (Journal of the American Medical Association, November 13, 1915, p. 1,717.)

Under "Prevention of Ringworm and Favus" the author urges the following: (1) Report all cases to the Health authorities. (2) Examine all children in a school where there is a case. (3) Prevent spread through a family by limiting children playing together. (4) Disinfect all houses which have had a case.

The treatment advocated is as follows: (1) Shave scalp. (2) Remove crusts by soaking head in cotton-seed oil to which 1 per cent. betanaphthol has been added. (3) Wash with sulphur soap. (4) Depilation as fast as the hair grows for at least three months. (5) Antiseptic applications—tincture iodin, $\frac{1}{5}$, alcohol $\frac{4}{5}$. (6) Ointment then applied: Hydrargyri precipitati flavi, 1 part; sulphuris precipitati, 1 part; resorcinol, 1 part; olei cadini, 10 parts; adipio lanæ, 10 parts; petrolati, 10 parts. (7) Use individual toilet articles. (8) Roentgen rays in obstinate cases. H. R. M.

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